The Northwestern MILLER

MILLING PRODUCTION SECTION

Containerization in Bulk Material Handling

By F. J. White, Jr.
Tote System, Inc.

One of the fastest growing techniques in bulk material handling is the use of portable unit containers. Containers can be fabricated of various materials and their capacities will normally vary from 3,000 to 10,000 lb. The containers, along with the automatic accessory equipment for filling, transporting, and discharging, are adaptable for inter-plant shipments or for solving in-plant handling problems. The efficiency in handling is comparable to large, fixed bulk storage, and they have the advantage in most cases of lower cost, simplification of conveying equipment, flexibility, and better product protection.

Containers, in this discussion, will be limited to units adaptable for bulk handling dry materials such as flour, sugar, salt, milk powders, coffee; plastic resins and all types of chemicals. They are applicable to two general types of operation, inter-plant shipment by truck, rail or barge, and for the solving of in-plant handling problems.

EDITOR'S NOTE — Mr. White's paper was delivered before the 1959 semi-annual meeting of the American Society of Chemical Engineers.

Our discussion will primarily be based on the Tote System, which was the first to be introduced on a nationwide basis, and by far the most widely used system of portable containers. The heart of the Tote System is the Tote bin which is fabricated from either aluminum, steel, magnesium or stainless steel. About 90% of all the tens of thousands of bins now in service are fabricated from a high-strength aluminum alloy, which has the advantages of light weight, compatibility with nearly all dry materials, and durability with the minimum amount of maintenance.

In nearly all cases the Tote Bins are fabricated with a base dimension of 42-in. x 48-in., which ties in well with standard lift truck equipment and is best adapted for shipments by truck or rail. The 42-in. dimension permits carrying bins on trucks two-wide the 42-in. way, and on rail shipments the bins are carried two-wide the 48-in. way.

The capacity of the bin is varied by changing the height of the sidewall sheet. The majority of the bins in service will vary in height from 5-ft. 9-in. to 8-ft. 3-in., with capacities of from 74 cu. ft. to 110 cu. ft. Depending on the product, the loads handled will vary from 3,000 lb. to 5,000 lb. Bins of this size, fabricated from aluminum, will vary in weight from 225 to 285 lb. Bins of each size are tareweighted to an even weight to simplify checking the net weight of product handled.

The standard bins are fabricated with 4½-in. drawn legs on each of the four corners, which permits handling with pallet-type lift trucks or any type of fork truck. The bins are equipped with a filling opening in the top, usually 9-in. in diameter, and a large discharge door across the bottom of one side of the bin. The air-tight design of the Tote Bin permits either inside or outside storage. The bins are also adaptable for high-piling to reduce warehouse storage space requirements.

First Operation

The first operation involved in the use of the Tote System is the filling of the bin and a number of different types of equipment and techniques are used in this operation. Where it is desired to pack a light weight aerated product, automatic packing equipment can be used, consisting of a jolter and a spinner. A spinner unit is lowered into the top opening of the bin and, by feeding product onto a fast traveling disc, the product is thrown to the sidewalls of the bin, eliminating the angle of repose in the top corners.

The spinner unit also contains an air filter unit to exhaust air as the bin is being filled. In conjunction with the spinner, the bin is packed by means of a mechanical or pneumatic jolter. The jolter raises the bins a varying height, up to ½-in., at a frequency of approximately 28 rpm. When the bin is filled, the spinner disc wipes in product and a sensitive overload relay automatically stops the whole packing operation, or diverts it to another packing station in a dual installation. The use of this equipment in loading product such as flour or powdered coal increases the payload carried in each bin by 15% to 30%.

In many cases the extra payload is not critical and more simple spouting techniques are used. Frequently, a Y-spout is used on a two-bin filling station. After the first bin in the station has been filled, material is automatically diverted to the second bin while an operator is removing the first bin and replacing it with an empty. In some installations of this type, bins are filled at a rate of from 20 bins to 25 bins an hour, which is the equivalent of nearly a carload of material per hour.

Where it is not practicable to fill the bins at a fast rate, another technique is available which eliminates the necessity of an operator standing by while the bins are being filled. In this type of operation, a distribution screw conveyor is located over the top of a line of bins. As the first bin in line is filled, the conveyor automatically carries material to the second bin and so forth, down the line. Periodically, an operator will remove the loaded bins and replace them with empty bins, again keeping the handling man-hours down comparable to a fixed storage bin installation. With the multiple Tote bin filling arrangement, various types of dust-tight connections are available between the filling conveyor and the Tote bin, including the necessary filters.

The next step in the Tote operation is the shipment. As mentioned previously, Tote bins can be easily shipped on standard truck equipment, either flatbed or van trailers. In other words, bulk truck shipments can be made without procuring special, expensive, single-purpose trailer units. Up to 16 bins can be carried on a 33-ft. van, but normally 8 to 12 loaded bins are all that can be handled due to state highway weight restrictions. In working out the economics of a truck movement, it is necessary to figure on the roundtrip cost since the empty bins must be deadheaded, as is the case with gasoline tank trailers, or other special bulk hopper trucks.

Rail Shipments

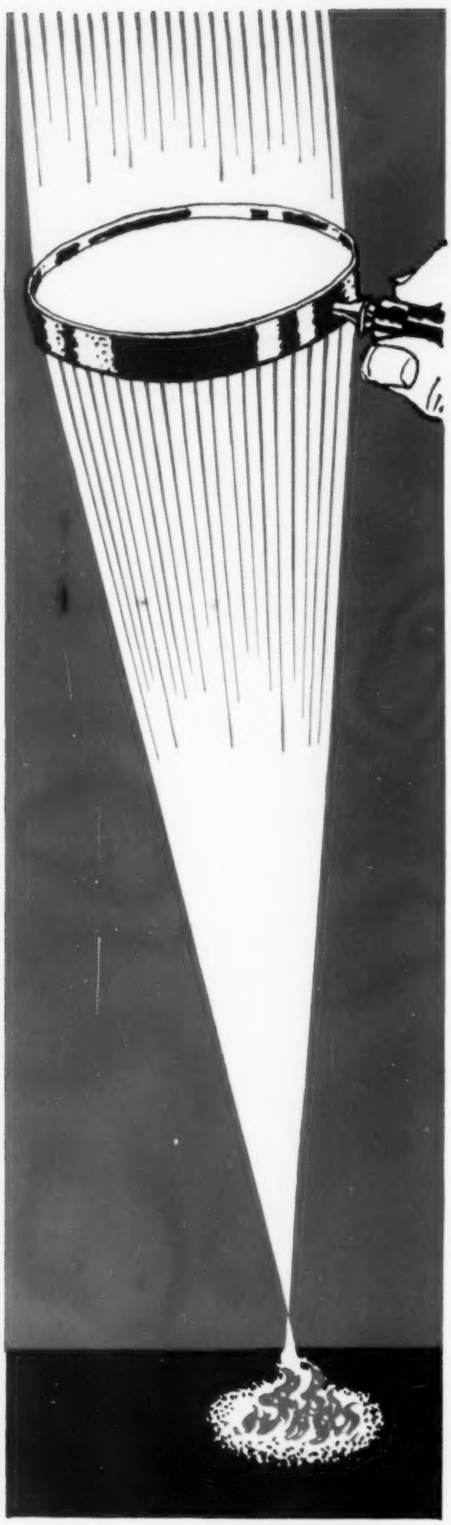
On rail shipments, container cars are available that permit shipping material in Tote bins without paying any freight cost on the weight of the bins when loaded with product or when being deadheaded empty. The first container cars available were leased privately by the customer. The railroads pay a mileage allowance for the use of the cars both loaded and empty. At the present time the mileage allowance is 4¢ a mile, and the rental cost of the car is approximately $135 mo. This means that if a customer's car travels a total of 3 400 loaded and empty miles per month, the lease cost of the car will be offset by the mileage allowance.

The latest development regarding container cars is that they are now being furnished by the railroads. At the present time the railroads are furnishing the container cars and the customers are furnishing the bins for the operation. Naturally, no mileage allowance is paid in this type of operation, but it eliminates the necessity of the customer furnishing the railroad equipment.

Since the economics of a container operation are determined by turnaround, water transportation is not

(Turn to BULK HANDLING, page 4a)

CONTAINER CAR—This container car, with 28 Tote Bins capable of carrying an average payload of 100,000 lb., is an example of the manner in which bulk material is being containerized for a growing number of industries. When the car arrives, the loaded bins are removed in less than an hour by one man with a standard lift truck. Then a set of empties is put back on the car for return to the supplier.



CONCENTRATION

Every Boy Scout knows that you can start a fine blaze by concentrating the sun's rays on tinder.

Concentration in any field brings positive results and the manufacture of industrial sifting cloth is no exception.

For over a century, Swiss Silk has specialized in the production of superfine sifting textiles with the result that throughout the world, wherever any ground product has to be sifted, SWISS SILK is the preferred medium. Abrasives, chemicals, pharmaceuticals, salt, cornstarch, and, of course, flour which led the way as the pioneer in the sifting field, has made SWISS SILK the favorite bolting textile. You can't buy better sifting cloth.

★ ★

SWISS SILK

BODMER
DUFOUR
EXCELSIOR
NITEX
SCHINDLER
WYDLER

★

A 'Camera Tour' of the First Flour Mill in the Philippines

Some of its features are: 17,250 lb. capacity an hour . . . two main floors . . . individual bleaching or improving for each stream of flour . . .

★

The first flour mill to be erected in the Philippines is now in full operation in Manila. Having a present output of 17,250 lb. an hour, the mill's machinery was supplied by Thomas Robinson & Son, Ltd., and the order for this equipment was valued at nearly $1 million.

With the successful completion and operation of this mill, the recently formed company, Republic Flour Mills, Inc., which has established this new industry in the Philippines, placed a repeat order with Robinsons for an additional mill.

The repeat order, worth three-quarters of a million dollars, will step up the mill's output of flour from the present 17,250 lb. an hour to over 31,000 lb.

Mill Design

Situated on the Pasig River the mill has been designed on two main floors which enabled two light subsidiary floors to be economically devoted to spouting and to the pneumatic cyclones and fans. This in turn has reduced the number of horizontal conveyors to a minimum. The rollermills are situated on the ground floor, and the Robinson Pneu-Flow system which enables stock to be lifted vertically through the machine, coupled with the use of individual motor drives, has obviated the need for a basement and ensured a clean, precise layout.

The sifters and the purifiers are placed on the third floor of the mill in an extremely attractive and workable layout, with clean lines of spouting and no conveyors. The sifters are high-capacity square-sieve sifters, based on the stacked sieve principle.

One feature of the Robinson all-metal Purifier type PHm is the tail sheet aspiration grid. This concentrates the stock on the end sieve into tapering channels and ensures a high classification which would not otherwise be possible.

There are four main worms, and each stream of flour can receive individual bleaching or improving as necessary. Prior to packing, the flour is redressed through Minsifters—compact sifting machines which give a very large dressing surface relative to the small floor space which they occupy.

The problem of packing the 17,250 lb. of flour produced per hour by the mill into 50-lb. calico bags is solved by using the fully automatic Robinson hydraulic packer, Type HWPa. This machine packs, sews and weighs the bags, and requires only two operators per shift.

Power and Control

A new Robinson system which permits rollermills to be push-button controlled, either individually or in groups, is included in the modern power and control layout. The system embodies a control panel where the operator can start the different groups of machines in quick succession. In addition, a stop-start unit adjacent to each half of every rollermill enables the operator to isolate that pair of rolls from the main control panel.

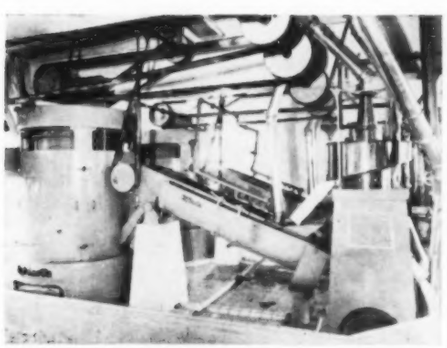
Crompton Parkinson, Ltd., supplied all electrical equipment, including substation switchgear. The 150 motors in the mill are totally enclosed

(Turn to PHILIPPINES, page 10a

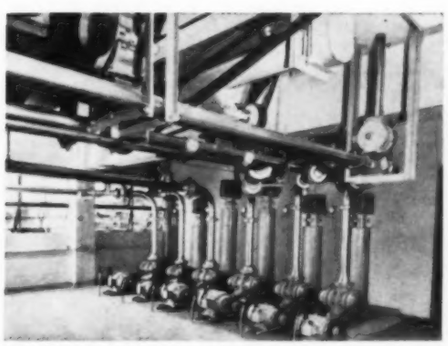
Other Features: Push-button rollermills controlled individually or in groups . . . five independent blowing lines with which to convey wheat . . .

★

LOCATION—Republic Flour Mills, Inc., the first flour mill in the Philippines, is located on the Pasig River. Bulk wheat is unloaded from grain ships at Manila into 350-ton barges which are towed up the river to the mill for pneumatic emptying.

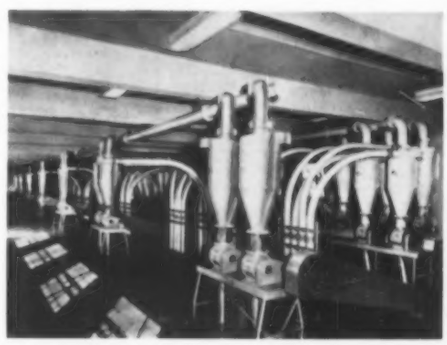


WHEAT WASHING—Two Robinson three-stage wheat washing plants are in use at Republic Flour Mills. The wide range of modern wheat cleaning machinery available permits the handling of wheats from all parts of the world.

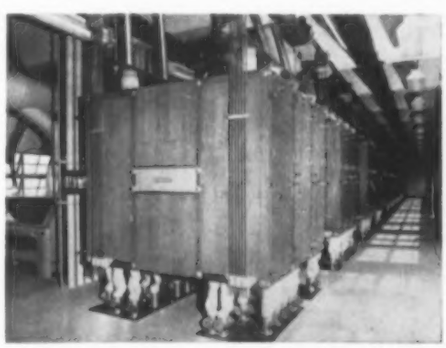


BLOWERS—Blowers in the pneumatic conveying of wheat in the screenroom, simple but space-saving, have helped to keep down building costs of the Republic mill, while handling greater capacities than conventional conveying systems.

ROLLERMILL — Republic's rollermills are situated on the ground floor. The Robinson Pneu-Flow system allows stock to be lifted vertically through the machine, coupled with individual motor drives, which make it unnecessary to have a basement.



CYCLONES—This is the cyclone floor at Republic Flour Mills. Stock is raised by suction to the cyclones, separated from the conveying air, and then permitted to fall by gravity to the plansifters.



SIFTERS—Stock is delivered from the rollermills to these sifters for sifting and grading. They are high-capacity, square-sieved and based on the stacked-sieve principle. Sifters and the purifiers are located on the third floor.

PACKAGING—The problem of packing 17,250 lb. of flour an hour into 50-lb. calico bags has been solved by using this fully automatic Robinson hydraulic packer. The machine packs, sews and weighs the bags, requiring only two operators a shift.

BULK HANDLING

(Continued from page 1a)

customarily used. However, when bins are shipped by barge, lifting lugs are frequently added to the top of the bin to permit ease in sling handling.

Now that the bins have been filled and transported, they are ready for storage and discharge at the plant. In warehousing, the bins are handled with standard lift truck equipment and, by high-piling only two high, a carload of material can be stored in less than 400 sq. ft. of warehouse storage space. This is considerably less space than required for storage in bags, drums and large horizontal storage bins, and is quite comparable with most silo storage. When ready for discharge, the bins are taken to a Tote Tilt discharge mechanism which normally will be located as close to the use point as possible in order to eliminate extensive conveying equipment. There are dozens of different types of discharge mechanisms that can be utilized, depending on the particular operation involved. However, all operate on basically the same principle. By lift truck, the bin is placed on a tilt mechanism, with the discharge door facing into the tilt hopper. The tilt is then elevated, rotating the bin to a 45° position, either by using an overhead electric hoist or by using a pneumatic cylinder under the tilt tongue.

When the bin is in the discharge position, it automatically is clamped into place, sealing against the gasket on the tilt for dust-free operation. The discharge door of the Tote Bin is then opened so that the product drops into the tilt hopper. One type tilt available is the gravity tilt, which permits material to discharge through the tilt into a surge hopper or processing equipment.

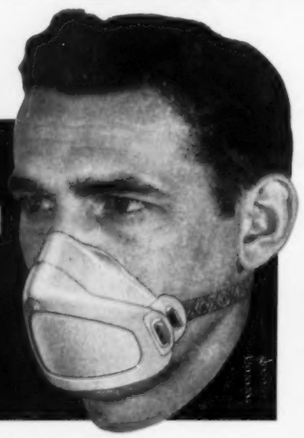
Where batch weighing or blending is required, a Tote Tilt with a screw mechanism in the bottom is utilized. One method of batch weighing is to mount the screw type Tote Tilt and drive motor on a scale platform. The operator sets on the scale dial the amount of the product desired to be drawn out of the bin and pushes the button. When this amount of material has been fed from the tilt station into the use point, the needle of the scale dial comes back to zero and automatically cuts off. This is known as the subtract weighing procedure which permits drawing small batches out of the large bin. Another automatic batch weighing method is to feed material from the screw type tilt into a weigh hopper. Frequently several different ingredients are desired in a batch and this is handled by setting up several tilt stations around the weigh hopper. The scale can be set up to automatically draw the desired size batch out of each of the various tilt stations in order.

The various components of a Tote operation have now been discussed including filling, transporting, warehousing and discharging. Before getting into the economics and discussing the costs and savings of a Tote installation, it might be well to describe a few specific installations to show how various customers are adapting this new bulk handling tool to their operations.

A good example of an in-plant Tote operation is an installation at the General Electric Co. plant in Cleveland, where the Tote System is being used for the handling of phosphor powders going into their fluorescent lamp coatings. Quality control and uniformity are extremely critical in this operation. Before making the Tote installation, as the material was processed and pulverized, it was fed into fiber drums. Samples were taken from the drums for laboratory analysis and the material was stored in

TOTE TILT — The accompanying photo illustrates how the Tote Tilt is adjusted to dumping position. When ready for discharge, the bins are taken to a Tote Tilt discharge mechanism which normally will be located as close to the point of use as possible to eliminate extensive conveying equipment.

FLEX-A-FOAM
DUST MASKS



Here's everything that management and worker alike could possibly want in a dust respirator!

1. Form-fitting design: Self-adjusting to any size and shape of face without pressure or irritating discomfort.
2. Attractive styling: Smartly designed to suit the most discriminating wearer.
3. Filtering efficiency: Filters non-toxic dusts 100 times smaller than the eye can see.
4. Easy-breathing comfort: Easier to breathe through and talk through than an ordinary pocket handkerchief.
5. Feather-like weight: Weighs only 1 ounce complete.
6. Simplicity and economy: Only 4 tough, long-wearing, interlocking parts — all washable. Pure latex filter outwears throw-away type more than 100 to 1.

No wonder FLEX-A-FOAM is the one dust respirator workers welcome and WEAR!

Sample only $1.45 postpaid Industrial price only

FLEX-A-FOAM DUST MASK

FLEXO PRODUCTS, INC.
Westlake, Ohio

For Mills, we recommend . . .
Talismanic
BELT DRESSINGS
Specialized for Your Industry
Belt Clinch No. 2 (liquid) and Bar Belt Dressing No. 3
These dressings are preferred by 75% of our flour mill customers.
WRITE FOR GENEROUS SAMPLES
JOHN C. CHAMBERS CO.
1827 N. LeClaire Ave.
Chicago 39, Ill.

Faster Service For Mill and Elevator With
"WILLIAMS WAY SERVICE"

THESE AND OTHER ITEMS IN STOCK FOR SAME DAY SHIPMENT

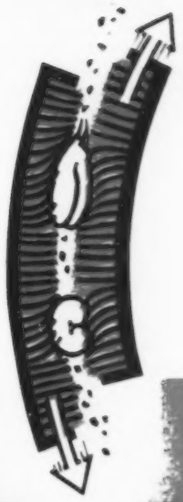
- ☐ Swiss Silk and Nitex Bolting Cloth
- ☐ Tyler Wire Cloth
- ☐ "Bind-o" Edging for Wire Cloth
- ☐ Nylon Sifter Tubes
- ☐ "Williams Way" Sifter Brushes and
- ☐ Rubber Ball Cloth Cleaner
- ☐ Graton & Knight Nycor and Leather Belting

PHONE OR WRITE

Representing
SIMON-CARTER CO.
PRATER PULVERIZER CO.

Mill Supply Specialists
Since 1905

H. R. WILLIAMS MILL SUPPLY CO.
1320 MAIN ST. Phone Victor 2-3232 KANSAS CITY, MO.

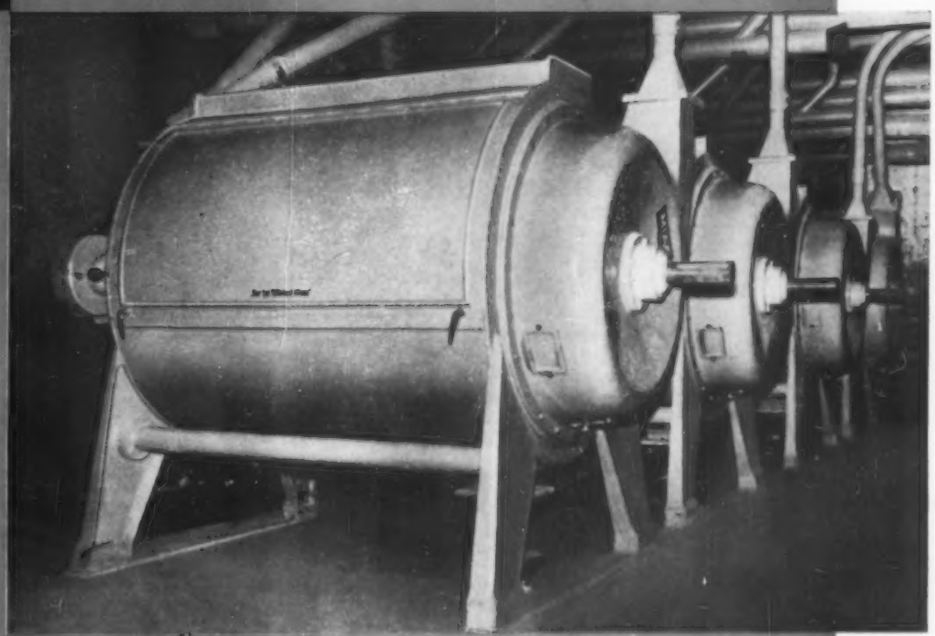


MIAG brush machine and scourer in all-metal design with brush resp. beater systems running in opposite direction.

Special machine design with built-in propellor to achieve a high initial grain velocity for cleaning houses with pneumatic conveying.

An efficient cleaning of the grain is accomplished between the two adjustable sets of brushes running in opposite direction. The screen sections of the outer system are kept clean automatically.

The micro photograph (enlarged) above shows the offals from grain brushing consisting of beeswings and wheat brush hairs.



MIAG

BRAUNSCHWEIG / Western Germany

Design and construction of complete flour mill and grain storage plants including all mechanical and pneumatic handling systems for grain unloading, cleaning house, mill and warehouse.

Agents for

U.S.A.
MIAG NORTHAMERICA INC.
1616 SO. 8 TH STREET MINNEAPOLIS 4, MINN.

Canada
THE TRIMONT CORP. LTD.
P. O. BOX 25, STATION "H" MONTREAL, P. Q.

the warehouse. The laboratory reports came back with formulas requiring rather complicated blending.

There were a number of problems in this type operation, such as excessive labor-handling costs, excessive warehouse storage space requirements, dusting and spillage, and quality control, since this was still at the mercy of the personnel handling the blending operation.

Several solutions were studied and the Tote System turned out to be the best and most economical answer. Now 150 to 200 bins are used in the operation and are filled directly from the pulverizing equipment. Laboratory samples are taken as the bins are filled and the bins provide airtight, compact and clean storage. After the laboratory analyses have been received, the bins are taken to the discharge area. In this area there are 16 screw-type Tote Tilts on individual scale platforms. The operators set the desired batch size on each of the scale dials and the batches are automatically and accurately drawn.

Probably the largest in-plant opera- ons are those in the plants of a rge synthetic detergent manufac- rer. The problem here was quality ntrol and packaging efficiency. Material coming from spray towers subject to uniformity variations, oth in density and quality. In some f the earlier operations, material as put directly from the spray ower into large surge bins which liminated the possibility of obtain- g the quality control desired in the nished product. Now, in the various lants, the material from the spray owers is all placed into Tote Bins where it is checked for quality and density.

The bins are filled 24 hours a day and are discharged into the packaging lines during the eight-hour day shifts. Up to 20 carloads of material are being handled daily in this manner in several plants. The installation includes a reject tilt station for feeding back off-grade material. The operation also includes segregation of light weight and heavy material in the bins, and blending them going through the packaging stations. The installation also minimizes product degradation by eliminating all previous conveying equipment required for filling and discharging from the large storage bins. The discharge tilts used in this operation are the gravity type, feeding into a surge hopper, over a shaker screen, and then to the package line.

Another smaller, simpler, but equally efficient in-plant operation is an installation at the Victor Chemical Works, Chicago Heights, Ill. The problem here was again uniformity of specialty phosphates, turned out on a continuous basis. The problem was solved by putting all processed material into Tote bins and holding them until laboratory checks were received. The bins are blended by discharging through two screw-type Tote Tilts, which feed into the boot of the bucket elevator and convey material to finished packaging. One of these screw-type Tote Tilts has a standard drive motor, and the other has a variable speed drive. Consequently, they can blend at any desired ratio called for by the laboratory analysis.

A more elaborate in-plant installation is now being made by a large manufacturer who produces a wide variety of products. Changing from one product or one color to another is quite a problem and consequently fairly long runs on each product are made. This means it was necessary to maintain in their warehouse a supply of every material in each type of package so they could ship to customers in whatever type package they desired. This included 50 lb. bags, 80 lb. bags, 100 lb. bags, fiber drums and 1,000 lb. cartons.

Needless to say, this operation took up a great deal of room and also necessitated a rather complicated packaging arrangement since, when they were processing a certain type of resin, they had to be set up to package it in all of the various media. Again, this problem was solved by the use of Tote bins. Approximately 400 bins will be used in this operation and it will be the first large scale use of magnesium bins. All processed material will be placed in Tote Bins and warehoused in that form. Then, as they receive orders for the resins in various types of packages, they will be able to discharge the bins into whatever type of package the customer desires. This makes a tremendous saving in warehouse storage space requirements and also simplifies the packaging operation since it will cut down the number of packaging stations from 17 to 5.

The gravity tilt stations will be located high in the air over the packaging equipment and, consequently, inconvenient for an operator to open the discharge door in the Tote Bin after the tilt is in discharge position. Therefore, the tilt stations are being equipped with an automatic discharge door opening device which can be operated from the ground floor.

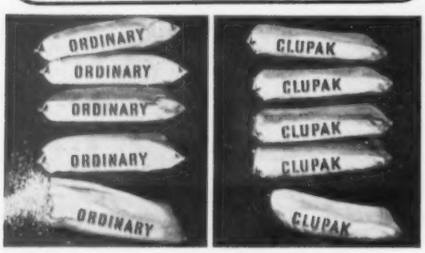
Other Installations

There are hundreds of other interesting case histories on in-plant installations such as those handling

YOUR CLUE TO BETTER MULTIWALL SACKS... EXTENSIBLE CLUPAK PAPER

WIDE VARIETY of products now being shipped in CLUPAK paper multiwall bags includes:

Aluminum sulphate	Perlite
Ammonium nitrate	Pigments
Calcium carbonate	Plant foods
Calcium chlorate	Plaster of Paris
Carbon black	Powdered insecticides
Cement	Pulverized rock
Clays	Polyethylene crystals
Cotton seed meal	Salt
Dehydrated alfalfa	Sand
Feed	Seed
Flour	Soybeans and meal
Fertilizer	Steric acid
Frits	Sugar
Hydrated lime	Sulphate of potash
Meal	Talc
Oyster shells	



DROP TEST comparison demonstrates CLUPAK paper's ability to resist shock. Multiwall sack made with CLUPAK paper (right), survives many more test falls than sack (left) made with ordinary kraft.

ROUGH HANDLING in shipping emphasizes CLUPAK kraft's toughness, ability to stand up where failure often occurs with ordinary multiwalls. Even when new, lighter bag constructions are used, the CLUPAK trademark is your assurance the bag paper meets the most rigid of shipping requirements.

DISCOVERY GIVES PAPER NEW "*TOUGHNESS*" ...MAKES IT ABSORB SHOCKS INSTEAD OF TEARING

BETTER PERFORMANCE, LOWER COST! CLUPAK Extensible Paper opens a new era in paper . . . makes it virtually a new material, with unlimited applications. For CLUPAK paper has built-in *stretch* or extensibility which lets it absorb the shocks and strains that cause ordinary paper to rip, tear and puncture. The result is a new dimension in paper — *toughness*. In multiwall sacks, CLUPAK paper toughness delivers far better performance . . . often at lower cost, by permitting fewer multiwall plies and a net saving in total basis weight. And CLUPAK paper *flexibility* can mean additional advantages — faster filling, easier handling and stacking.

BE SURE TO LOOK FOR THIS TRADEMARK

EXTENSIBLE CLUPAK® PAPER*

**Clupak, Inc.'s trademark for extensible paper manufactured under its authority.*

KEY FACTS FOR BUYERS

1 CLUPAK kraft is the same as ordinary kraft except that it is stronger, tougher and more flexible.

2 CLUPAK paper can be made in many basis weights and with varying degrees of stretch. Printability, surface friction, porosity and other properties can be controlled as with ordinary paper.

3 CLUPAK paper toughness and flexibility open up unlimited new uses for paper. Clupak, Inc. carries on continuous research and development work and results are made available to all licensees.

4 CLUPAK, INC. permits the use of its trademark only on paper which meets this company's rigid toughness requirements.

Clupak, Inc., 530 Fifth Avenue, New York 36, N. Y.

Buy CLUPAK paper and products made with CLUPAK paper from:

Albemarle Paper Mfg. Co.
Calcasieu Paper Co.
Canada Paper Co. (Canada)
Crown Zellerbach Corp.
Continental Can Company, Inc.
Dynas Aktiebolag (Sweden)
Hudson Pulp and Paper Corp.
International Paper Co.
St. Lawrence Corp., Ltd. (Canada)
St. Regis Paper Co.
Union Bag-Camp Paper Corp.
West Virginia Pulp and Paper Co.

soap chips, titanium sponge, milk powders, powdered coal, polyvinyl butyral, aspirin ingredients, record plastics for RCA, silicones, and nearly all instant coffee is being handled in a similar manner. An equal number of inter-plant installations are also in operation. The American Chicle Co. bulk-sugar handling installation in New York is a good example of an inter-plant operation involving the use of truck shipments. Empty Tote Bins are sent to the sugar refinery on a flatbed trailer where the refinery spouts sugar into them without removing them from the truck. The truck goes over a scale before and after filling to determine the net weight of sugar. Since no special bulk truck equipment investment is required by the carrier, the empty bins are picked up, filled, and returned to the customer's plant at a rate cheaper than previously handled bag shipments.

At the American Chicle plant a truckload of bins is unloaded and placed in storage in less than ½ manhour. At the discharge stations a screw-type Tote Tilt feeds into the boot of the bucket elevator, carrying the sugar to the pulverizer. The discharge of the screw-type Tote Tilt is through the same opening in which bags were previously dumped. It might also be well to look at the economics of this installation. The customer's cwt. savings, including bulk discount, reduced labor handling cost in unloading, warehousing, discharging and clean-up, as well as eliminating product loss, amount to approximately 35¢ cwt. Based on a usage of 80,000 lb. per day, this amounts to a savings of $280 per day, or $72,800 a year.

The over-all cost of the installation, including the Tote Bins, discharge station, and even the lift truck for handling the bins, was less than $30,000. The reason for these startling savings is the rapid turn-around on the bins since the customer is in close proximity to the suppliers. Each bin handles a net payload of 3,600 lb. and this means a savings of $12.60 each time a bin is handled. Average savings can be obtained by a turn-around of once or twice a month, but in this case the customer is rotating the bins nearly 8 times a month. American Chicle Co. has procured just enough bins for their operating needs, and maintain an emergency inventory in bags, which did not increase the cost of the bulk installation.

A similar installation was made for the Ford Motor Co., handling various powdered metals in their new sintered metal operation at Rawsonville, Mich. The bins are filled by their supplier and trucked to the Ford plant where they are unloaded and warehoused. In discharging, the four types of metals are placed on screw-type Tote Tilt stations on separate scale platforms. The operator sets the desired amount of product to be drawn from each of the bins and this automatically feeds from the screw tilt into a collector conveyor, which takes the batch to one of two blenders. After blending, the material is discharged into some special hopper bottom bins, and then fed into the machines.

Where truck transportation does not prove as economical as rail, there are two types of installations involving rail shipments. First, the bins can be shipped in a container car and, as mentioned previously, no freight cost is paid on the weight of the bin when loaded with product or when deadheaded empty. Several thousand Tote Bins have been put in this type of service by customers such as Du Pont, Standard Oil, Monsanto Chemical Co. and Victor Chemical.

The container car is so designed that, if desired, the bins can be filled without removing from the car. When the car arrives at the customer's plant, the loaded bins are removed in less than an hour by one man with a standard lift truck. Then a set of empties is put back on the car for return to the supplier.

The other type of rail shipment involves the use of bulk hopper cars. On many installations handling certain products, it is more economical to make the long haul shipment in bulk hopper cars, than to ship the bins back and forth on a container car. When the bulk hopper car arrives at the customer's plant, mechanical or pneumatic conveying equipment is used to transfer the material into Tote Bins. Normally, a distribution conveyor is set up over a line of Tote Bins so that no operator need stand by while the bins are being filled. In handling material such as flour, which would not readily flow from conventional bulk hopper cars, the

5 REASONS FOR CHOOSING PFIZER BI-CAP®
Enrichment Concentrates

When you make Pfizer your source for enrichment concentrates, you get all the benefits of Pfizer's long experience in vitamin production. In addition, BI-CAP offers the following specific benefits:

1. Even Dispersion—because the uniform-size particles flow readily and smoothly.
2. Excellent Stability—all forms of BI-CAP are made with thiamine mononitrate for better vitamin B_1 stability.
3. Two Strengths—single and double—for feeding to slow or fast flour stream.
4. Uniform Bulk—milled to minimum variation.
5. Light Color—Pfizer BI-CAP enrichment mixtures are light in color.

The BI-CAP line also includes new BI-CAP Bolted Cornmeal Enrichment, BI-CAP Whole Cornmeal Enrichment and BI-CAP Degerminated Cornmeal Enrichment mixtures. In addition, BI-CAP Macaroni Noodle Enrichment Mixture and BI-CAP Rice Enrichment Mixture are available. Full information about all Pfizer enrichment concentrates is yours on request.

Science for the World's Well-Being
Pfizer
Quality Ingredients for the Food Industry for Over a Century

CHAS. PFIZER & CO., INC.
Chemical Sales Division
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices:
Clifton, New Jersey
Chicago, Illinois
San Francisco, California
Vernon, California
Atlanta, Georgia
Dallas, Texas
Montreal, Canada

SUPERIOR CARBIDE TOOLS
For All Roll Corrugating
Economical Increased Output
CORRALLOY TOOL CO.
Minneapolis 7, Minn.

LET DOTY DO IT
If Your Lab Is Overloaded
Sanitation Analyses - Wheat and Flour
Doty Technical Laboratories
P. O. Box 7474
North Kansas City 16, Mo.

GATX Airslide car is normally used. National Biscuit Co. is now putting Airslide-Tote installations of this type into their bakeries at Denver and St. Louis.

A recent installation of this type, using conventional hopper cars, was put in for the O. Hommel Co., Carnegie, Pa. In this installation, six of their incoming ingredients are received in bulk and transferred into Tote bins. At the discharge stations, the screw-type tilts are again tied in with automatic scaling equipment to draw the desired size batches from any of these six ingredients.

Another installation of this type which permits a good comparison between a system of containers and large, fixed silos is a bulk carbon black handling installation at the Goodyear Tire & Rubber Co. plant in Topeka, or a similar installation for the Gates Rubber Co. in Denver. At the Goodyear Co. plant nearly two carloads of carbon black are received daily. They utilize six different types of carbon black and were considering the installation of a silo system similar to an earlier installation at their plant in Akron. This system would have involved six large silos for each type of carbon black and a complicated system of conveyors and large bins from each silo to each Banbury mixer. By transferring the material from bulk hopper cars into Tote Bins, the operation was appreciably simplified since the bins could be taken from the filling station to a point alongside the banburys.

Considerably less storage space is required in the Tote Bins since empty bins can be filled with whatever type carbon black is being received. With a silo system the empty space in one silo is valueless when another type of black is on the track. In this case, the Tote installation proved to be $90,000 less expensive from the standpoint of initial investment. In addition, it gave them flexibility, less product degradation due to reducing the amount of conveying, eliminating of bridging problems and saving of maintenance problems in extensive conveying systems. It also saved operational headaches such as getting the wrong type of carbon black in the wrong silo.

From an efficiency standpoint, the Tote System was comparable with the silo setup since one man could transfer up to two carloads a day into the Tote bins, which is comparable with transfer into larger silos. Handling this large volume means interchanging approximately two bins per hour at the tilt station. This required approximately eight minutes per hour and tied in nicely with the warehouseman who was supplying the banburys with other ingredients.

Case histories of this type could be discussed at considerable length, since each of the hundreds of installations involves certain problems which make every one slightly different from the others. Nearly all industries recognizing the high cost of handling material in expendable containers such as multiwall paper bags or drums are looking for more efficient handling techniques. Portable containers, such as we have described, are definitely one type of handling that should be thoroughly investigated. Containers themselves are normally not enough without a complete system for filling, transporting, discharging, batch weighing and blending. Over the past ten years, Tote System engineers have picked up a great deal of "know how" that is invaluable in adapting this system of portable containers to nearly any operation.

Complete Installations

Complete package installations are available, including not only the Tote Bins and discharge equipment, but also any of the conveying and scaling equipment required. Many of even the larger companies prefer to handle the package installations on a lease basis rather than as an outright purchase. This eliminates the necessity of a large capital investment and the lease payments are tax deductible.

In some cases, it has been felt that a containerized system of bulk handling is only a halfway step between bag handling and handling in large, fixed silos. A careful analysis will usually show this is not the case and that labor handling costs are quite comparable. A carload of material in Tote bins can be unloaded in one to two manhours, which is as fast or faster than transferring from a bulk hopper car into a large silo. Therefore, the only extra labor cost in handling Tote is in interchanging bins at the tilt stations. It takes approximately four minutes to interchange a bin at the tilt station, and a customer using 100,000 lb. of material per week would be interchanging approximately 25 bins. This means spending less than two manhours a week, and actually the job is normally accomplished by an operator who must be in the area for other purposes.

A number of other portable containers have been introduced over the past few years and it might be well to briefly discuss some of these. Quite a little work is being done with cardboard boxes having a capacity of from 1 to 3,000 lb. Normally these are one-trip containers and are primarily adaptable to small or medium sized users. The cost of the cardboard compared with the paper bag in cents per cwt. is normally about the same or slightly higher, but the

The Roche Review Of Enrichment Requirements

for Cereal Grain Foods in the United States

All figures represent milligrams per pound

PRODUCT	Thiamine (B_1) Min.	Thiamine (B_1) Max.	Riboflavin (B_2) Min.	Riboflavin (B_2) Max.	Niacin Min.	Niacin Max.	Iron Min.	Iron Max.
Enriched BREAD or other *baked* products	1.1	1.8	0.7	1.6	10.0	15.0	8.0	12.5
Enriched FLOUR[1]	2.0	2.5	1.2	1.5	16.0	20.0	13.0	16.5
Enriched FARINA	2.0	2.5	1.2	1.5	16.0	20.0	13.0	*
Enriched MACARONI & NOODLE Products[2]	4.0	5.0	1.7	2.2	27.0	34.0	13.0	16.5
Enriched CORN MEALS	2.0	3.0	1.2	1.8	16.0	24.0	13.0	26.0
Enriched CORN GRITS[3]	2.0	3.0	1.2	1.8	16.0	24.0	13.0	26.0
Enriched Milled WHITE RICE[4]	2.0	4.0	1.2**	2.4**	16.0	32.0	13.0	26.0

* No maximum level established.

** The requirement for vitamin B_2 is optional pending further study and public hearings because of certain technical difficulties encountered in the application of this vitamin.

1 In enriched self-rising flour, calcium is also required between limits of 500-1500 mg. per pound.

2 Levels allow for 30-50% losses in kitchen procedure.

3 Levels must not fall below 85% of minimum figures after a specific test described in the Federal Standards of Identity.

4 The Standards state that the rice, after a rinsing test, must contain at least 85% of the minimum vitamin levels. The Governments of Puerto Rico and the Philippines also require this rinsing test. If the method of enrichment does not permit this rinsing requirement to be met, consumer size packages must bear the statement, "Do not rinse before or drain after cooking." Rice enriched by the Roche method will meet the rinsing test. The South Carolina law does not require a rinsing test on packages less than 50 pounds, as the rice in small packages is presumed to be sufficiently clean.

The maximum and minimum levels shown above for enriched bread, enriched flour, enriched farina, enriched macaroni, spaghetti and noodle products, enriched corn meal and corn grits and enriched rice are in accordance with Federal Standards of Identity or State laws. Act No. 183 of the Government of Puerto Rico requires the use of enriched flour for all products made wholly or in part of flour, including crackers, etc.

Brief, authoritative stories about the enrichment of many cereal grains have been gathered into a booklet which you may have for the asking. Just send your request for "The Vital Story of Cereal Grain Products" to the Department of Education, Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey.

Roche®

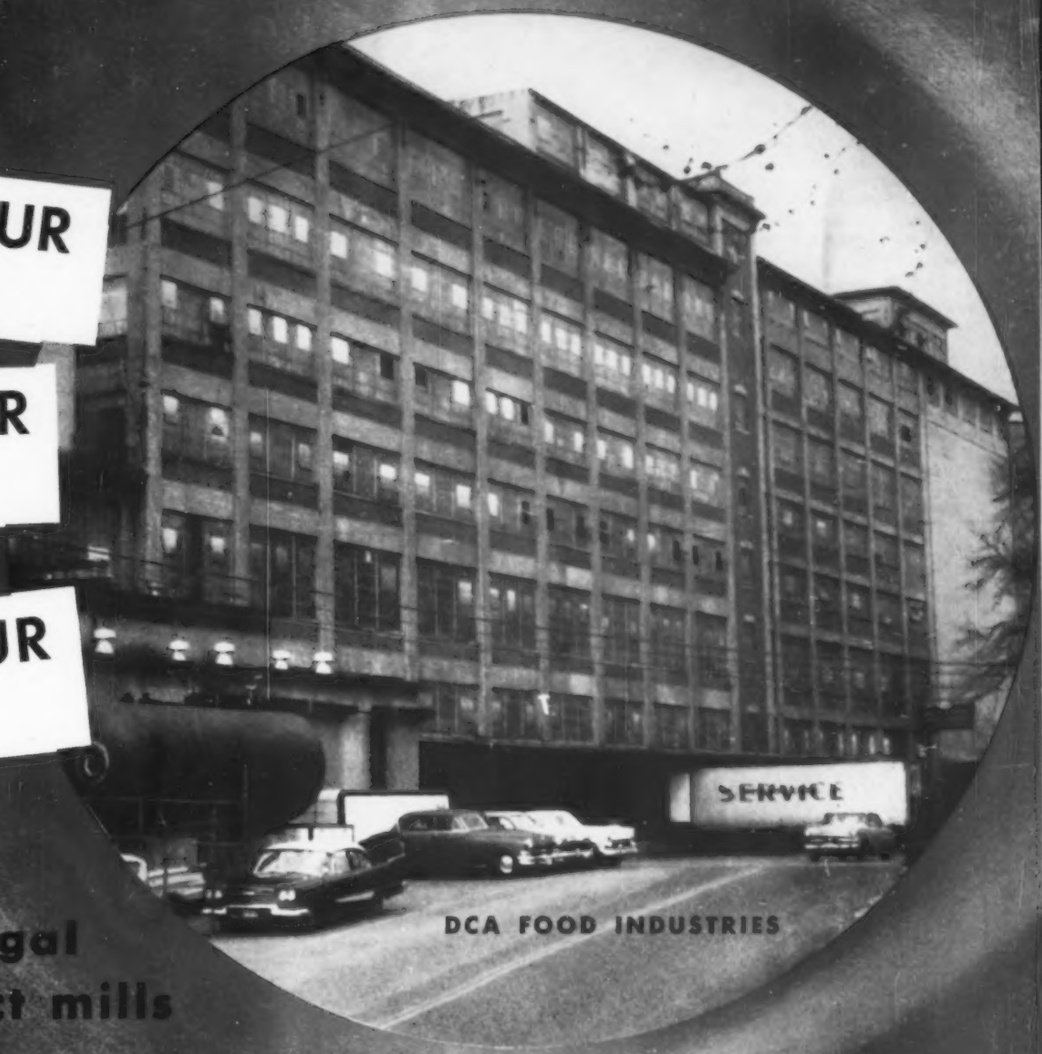
VITAMINS FOR ENRICHMENT COME RIGHT FROM ROCHE

INCREASE YOUR CAPACITY

INCREASE YOUR EFFICIENCY

DECREASE YOUR COST

with centrifugal impact mills



DCA FOOD INDUSTRIES

▲ Arthur W. Gust, of DCA Food Industries, shown with the recently installed 27" Entoleter Impact Mill that has increased DCA's capacity and lowered costs.

◀ Marvin D. Jackson, Milling Supt., D.C.A. Industries, Baltimore, Md.

DCA FOOD INDUSTRIES SOLVES A PROBLEM

DCA needed to increase capacity but did not have the floor space available for the usual roller mill. Marvin D. Jackson, Milling Superintendent for DCA Food Industries of Baltimore, says, "Our problem was solved very effectively and inexpensively with the new Entoleter Impact Mills and, as a bonus, our product has better uniformity and a finer texture."

Here are a few advantages of the Entoleter Impact Mill over the usual roller mill:

1. Requires only 40% of the space (can be overhead mounted).
2. Provides 75% greater capacity at the same HP.
3. Costs 30% less.
4. Needs much less maintenance (lower operating cost).

ENTOLETER DIVISION
SAFETY INDUSTRIES, INC.
P. O. BOX 904 NEW HAVEN 8, CONN.

SAFETY RAILWAY SERVICE CORPORATION AUTOMATIC TIMING & CONTROLS, INC.
THE HOWE SCALE COMPANY

customer does derive a more efficient method of car unloading and in-plant handling. In some cases cardboard box assemblies are arranged so they can be returned and re-used. This reduces the container cost but adds cost in return freight and re-assembling.

Rubber Bag Container

Another type of container is the rubber bag, which again is adaptable for either truck or rail shipment. The most commonly used size is a unit of approximately 300 cu. ft. capacity, handling 10,000 lb. loads. It is a little less than 8-ft. in diameter and is approximately 8-ft. high. It is handled by picking it up from the center of the top, which means special lift truck or crane equipment and, due to its large size, requires large doorways, rugged floors and plenty of room. The primary purpose of the rubber bag is to permit collapsing for a more economical return shipment prior to the advent of the container car with containers returned free.

A number of other types of metal portable containers have been developed and, to avoid the patented discharge arrangement of the Tote bins, have usually been a hopper top or a hopper bottom type of unit. One such container developed several years ago was called the "Neste-a-bin". This bin is a 3-unit bin, comprised of a pallet bottom and two body sections that permit nesting.

Another container design has cone top and a drum closure. For discharge, the bin is inverted and emptied through the drum opening.

Containerization for bulk handling dry materials is still in its infancy and undoubtedly dozens of other designs and ideas will be forthcoming. In a comparatively brief paper it is rather difficult to discuss all the details and economics of containers compared with other bulk handling techniques, such as large fixed storage bins.

In summary, we hope that we have shown: (1) A container system can be designed that will efficiently handle from two carloads a month to two carloads daily, and (2) A container system is competitive with handling in large, fixed storage bins from a labor handling standpoint, and is usually less costly and more flexible.

Help Fight TB

Use Christmas Seals

PHILIPPINES

(Continued from page 3a)

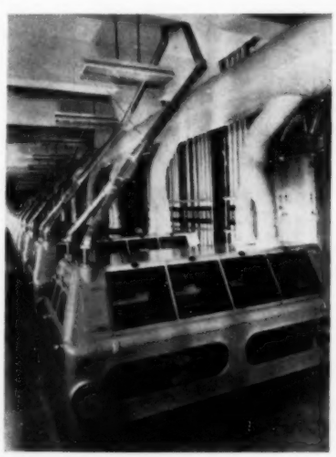
and fan cooled, the majority being the squirrel cage type.

Control boards and switch panels are located at strategic points relative to the various groups of machines, and a diagrammatic panel is conveniently placed for the screensman. The diagram couples controls and indicators and shows the flow of the wheat from the silos, through the bins and screenroom to the first break.

Handling and Cleaning

Wheat is unloaded in bulk from grain ships into 350-ton barges in Manila Bay. The barges are then towed up the Pasig River to the mill, where they are emptied pneumatically. Since grain is imported in ships with a hold capacity of over 2,000 tons, each silo bin has been designed to hold the same capacity.

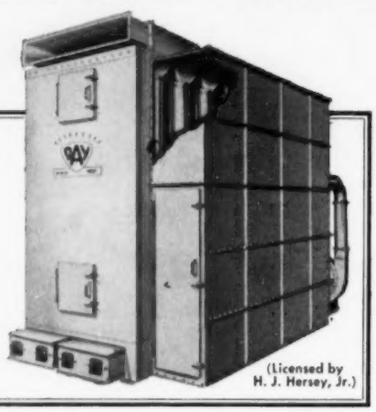
The comprehensive range of modern wheat cleaning machinery installed enables Republic Flour Mills to handle wheats from all parts of the world to take full advantage of market conditions. A Robinson Pneu-Flow pressure system which utilizes five independent blowing lines is used to convey wheat throughout the cleaning operation. This system has cut out much of the maintenance required by conventional conveying systems.



PURIFIERS — Purifiers, along with the sifters in the new Republic mill, are on the third floor. Emphasis has been given to provide an attractive, workable layout, with clean lines of spouting and no conveyors.

DAY

DUST CONTROL NEWS



Largest selling filter of its type in the world!

DAY "AC" Reverse Jet Dust Filter

Cutaway view of DAY "AC"— available housed or unhoused — for pressure or suction.

(Licensed by H. J. Hersey, Jr.)

Better Dust Control Systems Cost Less When They Include a DAY "AC" Reverse Jet Filter!

Less equipment needed — Filtering rates for a DAY "AC" are 10 to 20 cubic feet of air per square foot of filter media. These are about five times greater than old style filters. This means you get maximum filtration from a minimum filter investment. Because virtually 100% of the DAY "AC" is operating at all times, no money is wasted on intermittent or standby units. One DAY "AC" will filter and keep separated, dusts from up to 10 different sources!

Less maintenance — You know all equipment requires *normal* inspection and care. But you'll find many DAY filters have been on the job for 5, 6, 7 or even 8 years that have had no repairs whatsoever. In short, *the Day "AC" is built* to last! They have an "appetite" for work and a reputation for dependability and long life.

Less space needed — Because of smaller diameter felt filter tubes the DAY "AC" gives you a greater air handling capacity in less space. DAY "AC" filters occupy up to 50% less space — an important consideration for plants of any size!

99.99+% filtering efficiency — The real "pay off" on DAY "AC" filters is their ability to clean dust laden air with near perfect efficiency! Even "tough" materials such as carbon black or atomic energy materials are filtered with optimum effectiveness.

For additional information about the DAY "AC" reverse jet dust filter write toDAY for Bulletin F-75. It also contains pages of useful air engineering data.

The **DAY** *Company*

SOLD in UNITED STATES by The DAY SALES Company 822 Third Avenue N.E. Minneapolis 13, Minnesota

MADE and SOLD in CANADA by The DAY Company of Canada Limited Rexdale (Toronto), Ontario, Canada Ft. William, Ontario, Canada

Representatives in Principal Cities

EQUIPMENT ONLY OR A COMPLETE SYSTEM

. . . and here is how and why you can make such tremendous savings with it!

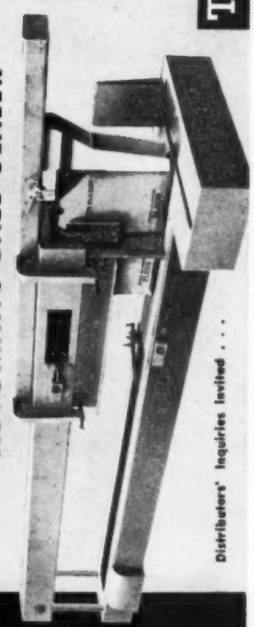
MATERIAL SAVINGS
TAPE SAVINGS OVER 98% GLUE COSTS LESS THAN 2% OF SEALING TAPE. EXAMPLE: PLANTS WITH OUTPUT OF 2,400 AVERAGE SIZE BALES PER 8 HOUR DAY CAN . . . .
SAVE EACH DAY IN MATERIAL ALONE $18.00 OR ANNUAL SAVINGS OF $5,616.00

LABOR SAVING
100% OR MORE OVER HAND-SEALING METHODS WHERE NORMAL 2 TO 4 MAN CREW IS USED. PACKAGING OPERATION IS CUT TO 1 MAN.
AVERAGE MINIMUM ANNUAL LABOR SAVINGS $5,200.00

MINIMUM SAVINGS (COMPUTED ON 2,400 BALES IN AN 8 HOUR DAY WEEK) AMOUNT TO $10,816.00 PER YEAR

Tol-O-Matic, Inc. 246 Tenth Avenue So. Minneapolis 15, Minn.

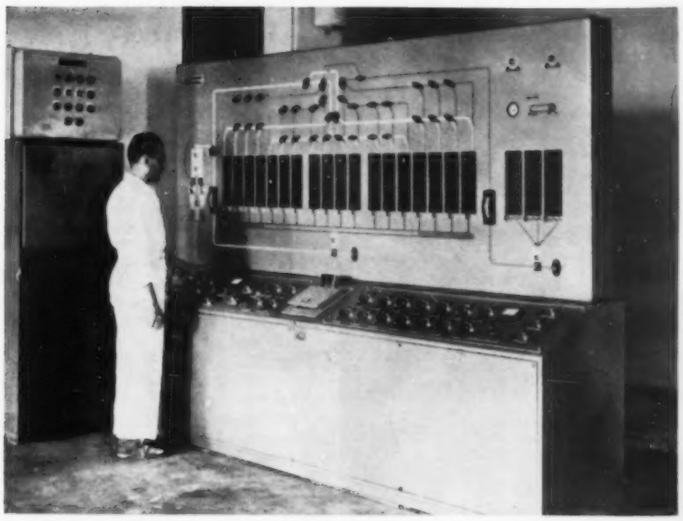
THIS IS THE Tol-O-Matic AUTOMATIC BALE SEALER



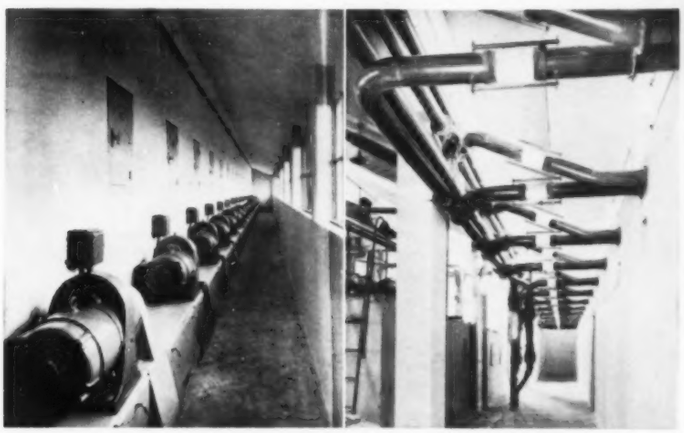
Distributors' Inquiries Invited . . .

How To Save 100% OR MORE On Sealing BALER BAGS

New Flour Elevator in Operation at Ravenna, Italy



CONTROL PANEL—The accompanying photo shows the central control panel for machines and conveying channels of the new flour elevator installed at the plant of the Societa Padana di Macinazione in Ravenna, Italy, by Buhler Bros. of Uzwil, Switzerland.



DRIVE STATIONS—In the photo at the left are the drive stations of the chain discharging machines beneath the 18 bins which comprise the flour storage facilities of the new Societa Padana plant at Ravenna, Italy. At the right are the conveying pipes, with valves, for distribution of flour into the 18 bins.

RAVENNA, ITALY—A new 2,300 metric ton flour elevator has been started up here by the Societa Padana di Macinazione. Plans, machines and the plant installation were done by Buhler Bros. of Uzwil, Switzerland, in close association with its allied house in Milan.

The flour is stored in 18 bins, all provided with chain-discharging machines which distribute the flour over the entire bin area. This bin form, without inclined hopper walls, allows for best mixing efficiency and makes bridging impossible, it was pointed out.

For sacking-off and mixing, Buhler installed what is said to be the biggest fluid-lift conveyor ever built in Europe. The fluid-lift system is a pneumatic pressure conveying system with a very high mixing ratio of little air with much product. The result is a slow conveying speed, and therefore, little power consumption, especially appropriate for high conveying volumes.

DAY has received many favorable reports from Pneu-Spout users. These reports tell about the speed, ease and low cost of installing Pneu-Spout. Here are a few of the many reasons why so many mills installed Pneu-Spout during the past twelve months.

- **SAVES TIME**—Pneu-Spout is supplied ready to assemble. It goes up four times faster than regular mill spouting. Unskilled labor can install and a hacksaw, file and screwdriver are the only tools needed for installation.
- **SAVES MONEY**—Pneu-Spout is re-usable. This makes it easy to change flows because it can be dismantled and re-erected quickly. It's also ideal for temporary spouting.
- **NO LININGS—NO DEAD SPOTS**—Pneu-Spout requires no linings. It is run directly through floors thus eliminating one of the main causes of chokes in mills that are wood spouted. Pneu-Spout is sanitary, non-corroding. Lightweight but strong, Pneu-Spout is made of aluminum; there are no non-metallic parts to rot or deteriorate.

FREE Pneu-Spout booklet gives complete information about this better spouting. Write for your free copy. Send your request to DAY.

The DAY Company

SOLD in UNITED STATES by
The DAY SALES Company
822 Third Avenue N.E., Minneapolis 13, Minn.
Representatives in Principal Cities

Exclusive USA Distributor for Pneu-Spout

MILL STOCK SPLITTER

for

Greater Extraction • Cleaner Bolting

FOUR OUTLETS SHOWN

It is important to preserve constant value of composition (coarse and fine) in divided mill streams intended for separation. The positive propulsion of our impeller and its adjustable flights gently nudge mill stock across a flat unobstructed surface to the point of discharge. This levels out pulsation. It is difficult to adjust bolting surface to a varying load. Get the benefits of dependable mill stock distribution with this splitter. It means higher percentage of flour extraction.

Write for full information

BEARD FOUNDRY & MACHINE WORKS
723 SO. FIRST ST. • ARKANSAS CITY, KANSAS

Setting Up a Quality Control and Technical Development Laboratory

By JAMES R. IRVING

LABORATORY quality control is a practical management tool. If used wisely, it can supplement the experience you have already gained, by constantly attempting to produce a lower-cost but better-quality product. Laboratory quality control can help you to gain the following: (1) Control over raw materials through the setting of specifications; (2) improvement of production quality; (3) improvement of formulas, and methods resulting in cost savings; (4) control of the finished product; (5) increased order and better housekeeping, and (6) greater customer confidence in the uniformly high quality of your merchandise.

Research, on the other hand, evolves more slowly. It is an investment in the future. It is keyed to improving the nature of materials and products that already have passed tests and met specifications. It is also keyed to improving production processes, to saving time and materials, to using by-products more effectively, to finding substitutes for scarce or expensive materials, to developing new products, and to providing better "trouble shooting" services for customers.

EDITOR'S NOTE: Mr. Irving is the director of technical services, the Scientific Apparatus Makers Assn., Chicago. His article is from Technical Aids for Small Manufacturers, a publication of the U.S. Small Business Administration.

On the one hand, a small firm's laboratory may be asked to solve bothersome technical problems by "this afternoon," "tomorrow," or "next week." These may be of great importance. On the other hand, research may study questions of how your product should look and behave 10, 15 and perhaps 20 years from now. Indeed, it may be designed to tell you whether you'll be producing a given product at all 20 years from now.

In most small company laboratories, of course, technical people must "double in brass." They have to serve both quality control and research functions. As a result, there often has to be a good deal of switching back and forth from one field to another.

Quality control work may open the door to research. By the same token, research must delve into control activities. In fact, quality control is the application of ideas and techniques derived from research.

So, even when you start out with a clear distinction between the control and the research aspects of your laboratory—and even though the objectives of the two are plainly different—an area of overlap will still exist where control and research go hand in glove. What follows in this aid seeks to reflect this close but flexible relationship.

Tax Advantages

Another consideration in your planning for laboratory expenditures is the advantageous tax treatment available. Under Section 174 of the Internal Revenue Code of 1954, you may now treat research and development expenditures by any one of three methods: (1) You may charge the expenditures against income for the year in which they are paid or incurred. (2) You may set up the expenditures as a deferred charge against future income beginning with the month in which benefits are first realized from the expenditures, you may charge the expenditures against income over at least a 5-year period. (3) You may charge the amounts expended as capital expenditures. Clearly, you should consult your own lawyer for advice on these and related problems.

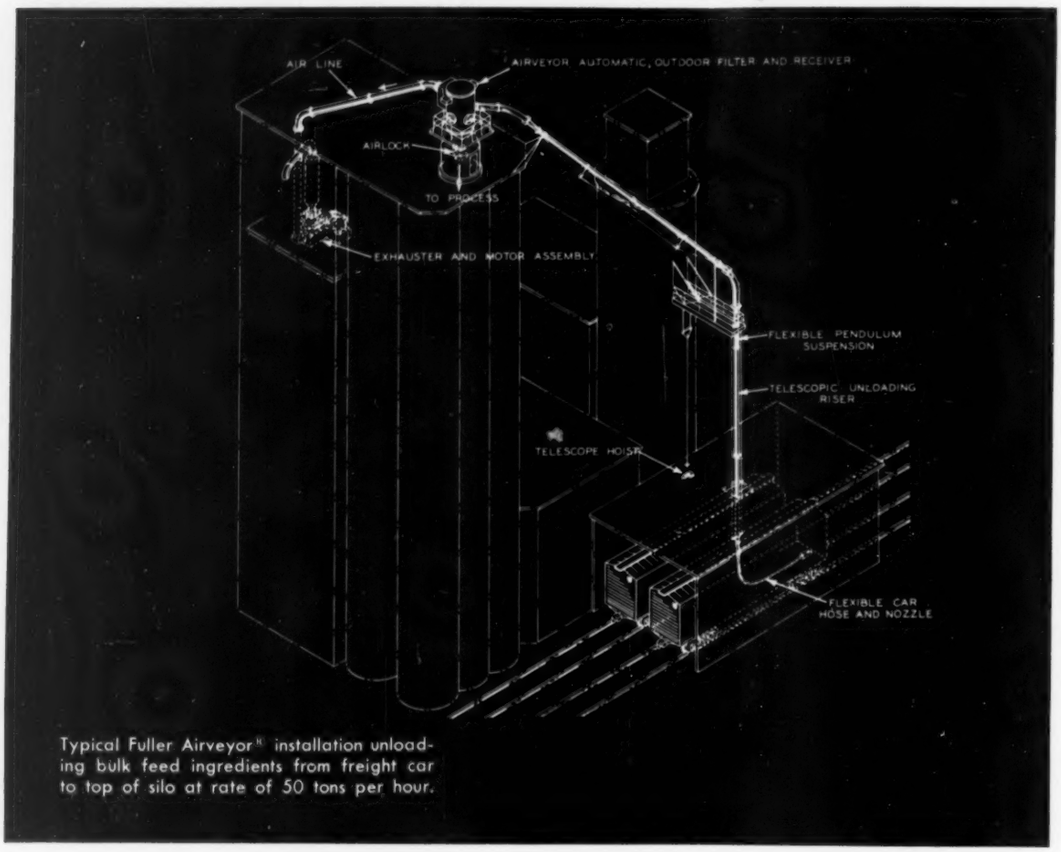
Laboratory Equipment

How much does laboratory quality control cost? Can you—a small business—afford it? These and related questions are prominent in the thinking of many managers. Astronomical figures are sometimes cited by the larger organizations. These are often more confusing than helpful to the manufacturer just starting to use scientific control. Expense needn't be staggering.

For example, good chemical laboratories can be established for less than $5,000, assuming a small amount of floor space could be made available. This amount of money is based on an initial expenditure of around $3,500 for basic instruments and apparatus with approximately $1,500 allotted for laboratory equipment (benches, hoods for carrying off noxious fumes, cabinets and furniture).

Overhead in terms of laboratory

(Turn to SETTING UP, page 14a)



Typical Fuller Airveyor® installation unloading bulk feed ingredients from freight car to top of silo at rate of 50 tons per hour.

How Fuller Pneumatic Bulk Materials Handling Can Help You Expand Plant Capacity

When plants processing dry, finely-divided bulk materials greatly expand production and bulk storage facilities, Fuller pneumatic equipment is most likely to take on the expanded materials handling job.

For example, a major Midwest feed company had been using a mechanical system to unload freight cars of barley, wheat, shorts, bran, dehydrated alfalfa and other feed ingredients. But, when the plant recently increased its number of storage bins from 10 to 40 and stepped-up deliveries of these ingredients a faster, more efficient unloading system was needed. The answer was a Fuller Airveyor® vacuum system—operated by one man at a pushbutton control. This system conveys as much as 50 tons of bulk feed ingredients an hour. The Airveyor® pneumatic lines were installed easily. Sanitary sealed-in system seldom needs maintenance and is inherently self-cleaning.

Consider the low initial cost and many operating economies of Fuller pneumatic conveying systems when you plan to increase plant capacity. Write or phone outlining your problem. Fuller will gladly furnish additional information with appropriate recommendation. 1175 A-268

FULLER COMPANY
156 Bridge St., Catasauqua, Pa.
SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION
Birmingham • Chicago • Kansas City • Los Angeles • New York • San Francisco • Seattle

Fuller
....pioneers in harnessing AIR

The Cereal Laboratory at Montana State

By C. A. WATSON

Funds were made available to the Agronomy and Soils Department of Montana State College in 1955 for the purpose of establishing a cereal quality laboratory. The laboratory was partially staffed and all equipment necessary to bake a loaf of bread was purchased and placed in operation during the following two years.

Some of the major items of equipment installed were a Buhler experimental flour mill, an Allis-Chalmers flour mill, a farinograph, fermentation cabinet, baking oven, dough molder and sheeting rolls. At the same time, equipment was purchased and placed in operation to test the malting quality of barley samples. Such items as mashing apparatus, constant temperature water baths, barley grader and barley pearler were installed.

EDITOR'S NOTE—Mr. Watson is the assistant cereal chemist in the Agronomy and Soils Department at Montana State College, Bozeman. His paper was prepared particularly to acquaint representatives of the milling industry with the cereal quality laboratory facilities at Montana State.

The quality laboratory is now able to conduct full scale milling and baking tests and barley extract and diastatic power tests. This addition to the Agronomy and Soils Department has been an immeasurable aid to the plant breeders in selecting both wheat and barley of certain inherited quality characteristics.

The installation of such a laboratory, plus an expanded plant breeding program, shows the concern that Montana has over the quality of its farm products. Efforts are now being directed towards developing higher yielding spring wheats of desirable quality to compete with the high yielding winter wheats of less desirable quality grown in Montana. Also, there are programs being directed towards developing winter wheats with superior milling and baking qualities and possessing good winter-hardiness. The barley program is directed towards developing a six-row malting barley, a more plump and less shattering Betzes malting barley, and low protein producing malting barleys.

Gratitude is expresed to the Malting Barley Improvement Assn. for its financial support on the malting barley program and to the Montana Wheat Quality Council for its financial aid on the wheat program.

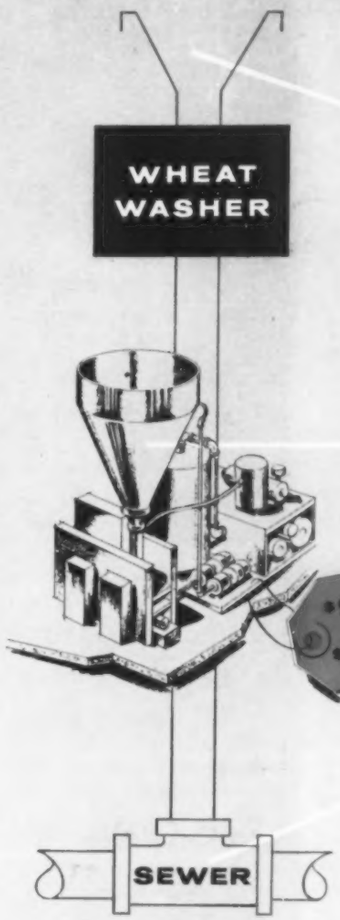
The first annual report of the cereal quality laboratory was completed in January, 1959. A limited number of these are still available.

JONES-HETTELSATER CONSTRUCTION CO.
Designers and Builders for Milling Companies
1911 Baltimore Ave. KANSAS CITY 6, MISSOURI

mix with the best..
Mathieson Bicarbonate of Soda

An ingredient in the finest products of the milling field for more than 60 years, Olin Mathieson bicarbonate of soda can always be relied on to maintain the highest standards of purity and consistent quality. Check your requirements against the following grades: U.S.P. Powdered and Granular; Miller's Special Regular and Miller's Special No. 2; and Fine. Available from Saltville, Va., and strategically-placed distributor stocks. For additional information and samples just write:

OLIN MATHIESON
CHEMICAL CORPORATION
CHEMICALS DIVISION
BALTIMORE 3, MD.
7029



If you're putting 10-30 G.P.M. here...

The addition of this NEW low-initial-cost, fast-pay-off IPI Recovery System *

Eliminates Sewage and Water Problems... Recovers Profitable Feed Supplement
(Equivalent to one hour's grind in 8 days or less.)

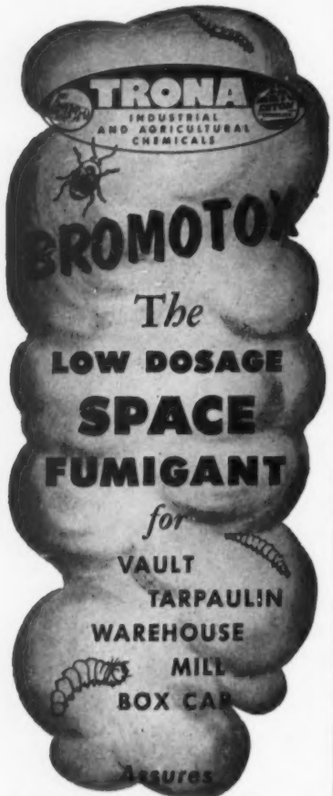
* **$9800.00** is price for complete package unit, including integral wiring and plumbing, ready for connecting to water source, sewer and power, F.O.B. Portland, Oregon, *plus license*.

$7500.00 is price for "do-it-yourself" installation, F.O.B. Portland, Oregon, *plus license*.

Send for folder explaining IPI Recovery System in more detail.

There's an IPI Recovery System for ANY Flow requirement

IPI Industrial Processes, Inc.
621 S. W. Morrison, Portland 5, Oregon



- MAXIMUM RESULTS
- GREATER SAFETY
- MORE ECONOMY

Bromotox, a mixture of ethylene dibromide and methyl bromide, is an effective, safe and economical space fumigant. The stronger odor and lower dosage requirements of Bromotox result in greater killing power, increased economy and maximum safety. It is longer lasting, more penetrating and leaves no residual odor. Bromotox allows positive control of granary and rice weevils, Angoumois grain moth, confused flour beetle, Mediterranean flour moth, raisin moth, cheese mites and many other pests infesting grain, flour, rice, cheese and dried fruits. Available in cans packed twelve per case as well as 10, 50, 120 and 170 pound cylinders.

*TRADE MARK AP & CC

Other Eston Fumigants:

ESTON METHYL BROMIDE
The Versatile Fumigant

M-B-C FUMIGANT
Methyl Bromide with 2% Chloropicrin

A Product of
ESTON CHEMICAL DIVISION

American Potash & Chemical Corporation

3100 E. 26th St. Los Angeles 23, Cal.

Midwestern Distributor

FERGUSON FUMIGANTS

SETTING UP

(Continued from page 12a)

materials—replaceable glassware, chemical reagents, and so on—will average from $800 to $1,200 per year for each technologist working in the laboratory.

You should recognize, of course, that a chemistry laboratory is relatively inexpensive to set up. Many other types are much more complicated; for example, metallurgical or mechanical laboratories. But the point is this: Don't just assume that everything is prohibitively costly. Careful investigation may reveal ways of getting what you need at a price you can pay.

The major investment is often in terms of personnel. Many businessmen say, "The most important equipment in a laboratory is in the head of the man running it." In this vein the best available talent usually proves to be the least expensive in terms of getting the most out of a new laboratory. Therefore, pay is an important item.

College graduates with bachelor degrees in various branches of the sciences are currently receiving from $425-$450 per month to start. A scientist having five years of practice in his field will make a greater contribution than a new graduate, and compensation ranging from $550 per month to $710 seems to bear out that fact. Ten years of experience in a field calls for salaries ranging from $8,500 to $12,000 a year.

On the one hand, it is often highly worthwhile to pay a little more to find just the right person for the job—one, perhaps, who has concentrated in exactly the same field as your particular operation. On the other hand, your industry may not offer a very large supply of available personnel. Actually, this situation is no cause for alarm. Well-trained scientists are adaptable. Many times you gain an advantage by having a young scientist apply his experience in an allied industry to your particular problems.

Furthermore, each control laboratory builds up a personality all its own. No matter what an operator's experience is in an allied or comparable field, he will still need time to fit himself into your particular operation.

Independent Laboratories

For one good reason or another you may decide that setting up your own laboratory would not be a wise move at the present time. In this case, there are more than 500 independent scientific laboratories throughout the country which can provide quality control, independent research, and inspection for you. Scientists who operate these consulting laboratories have a high code of ethics. Their word when reporting on your products is reliable. Their methods of operation insure complete secrey in matters pertaining to your business.

Many companies use these private laboratories. Their rates are comparable to doing the work in your own plant with the exception that they get paid only when they are working on a project. Thus, the small plant is often able to use the resources of several thousand chemists, engineers, metallurgists and other technical personnel. Additional information on this point may be obtained from the American Council of Independent Laboratories, Inc., 4302 East-West Hwy., Washington 14, D.C.

If, however, you are "sold on the idea" of putting in scientific laboratory quality control, the next step is to get off on the right foot." Remember that for years you've been trusting to "Joe's judgment" as to whether your raw materials were "O. K." or "no darn good." Joe's been pretty proud of your confidence in him. Many people in your plant have learned to respect him for this very confidence. Or, it could be Mary or Ruth who could always taste "something off-color" in the last batch of creams or syrup. It could have been Pete, an old, reliable employee of your plant, who could tell by lifting it whether the casting had the right "feel." You know the approach.

What, then, is this new idea of yours going to do to these people? What about office, production, and sales personnel? Are they going to favor having a laboratory now, or having a laboratory technologist working with them?

The way these questions are answered may easily determine whether the introduction of quality control and research and development will be a success in your plant or not. People fear most what they do not understand. Most of your production people—including a few of your management executives—may be very much afraid of the whole idea. If so, you must be extra careful about preparation and timing relative to the introduction of the laboratory. The key to the success of a quality control laboratory is the individual who has to work with it. Essentially, if an individual has to work for a laboratory, it won't last long.

The preparation step in your plant might well begin with a calling together of all management personnel—sales and production—and first line supervisors. The union stewards, if there are any, should be given an appropriate role in this first meeting. The initial session might well be set aside as a problem-solving conference. From this could follow a program of checking all incoming raw materials. This could keep a chemist, or a metallurgist, or an engineer busy, and it is a logical beginning step in controlling quality.

The discussion leader in the first meeting might do well to call attention to the fact that the entire idea of keeping a closer check on quality is keyed to increasing sales, lowering costs and, in the last analysis, guaranteeing jobs—many times with higher pay.

The theme of this first meeting can be eliminating the new aspect of quality control. Everyone attending the meeting has, at one time or another, been called upon to say something about the company's products. Color, size and general appearance of the product are common knowledge

Need New Rolls?

In addition to our roll corrugating and grinding service for the flour milling industry, the Twin City Machine Co. also supplies new rolls, and we will be pleased to receive your inquiries.

TWIN CITY MACHINE CO.

Roll Corrugating and Grinding New Rolls
527 Second Avenue, S.E. Minneapolis Minn.

First Choice Wherever Grain is Handled

Your jobber has them, or write B. I. Weller Company, 327 South LaSalle Street, Chicago 4, Illinois.

(1) The logarithmic curve design loads easier . . . dumps cleaner . . . permits high speeds.
(2) Scientifically formed lip aids in greater cup capacity.
(3) Belt-hole placement gives better cup balance . . . saves belting.
(4) Hyperbolic sideboard ends permit greater load capacity without "slopping."

CALUMET CUPS

CHECKERBOARD GRAIN COMPANY

MILLING WHEAT • COARSE GRAINS • MILLFEED

Hard and Soft Winter Wheat

CHICAGO • ST. LOUIS • KANSAS CITY • MINNEAPOLIS

among your people. Laboratory control is just another, more exact form of measurement. You might ask for various problems that have come up in production recently that could have been prevented by checking incoming raw materials.

Building on this beginning, it shouldn't be long before the most scientifically conservative foreman will be asking why the technologist can't do a little trouble-shooting on his phase of the operation. The entire plant personnel should soon realize the possibilities of using their laboratory to: (1) Check incoming raw materials, (2) check items or products in production, (3) evaluate the finished product, and (4) use the facilities for applied research problems, improving present methods and products, and creating new products.

The scientific worker is not necessarily a genius. But he does have the capacity for taking infinite pains. He is intellectually curious, eternally haunted by questions: What? How? Why? He has imagination and he's just as responsive to a word of praise or a pay boost as the next member of your work force. He wants to be an accepted member of your team. Perhaps his most distinguishing characteristic is a trained, open mind. He gathers facts and classifies them logically and mathematically without reference to his own likes and dislikes.

Once a technologist becomes familiar with your operations and problems, it is this same type of mind that will inevitably pick up problems for more thorough investigation — that is, research.

The transition, of course, between quality control work and research should not be dismissed too lightly. It's easy to form an over-simplified opinion of what's involved. To be sure, although research sounds academic, it is often more a point of view than anything else. As Charles Kettering said, "Research is a high-hat word that scares a lot of people. It needn't. It is rather simple. Essentially, it is nothing but a state of mind—a friendly, welcoming attitude toward change." Nevertheless, while this approach contains a valuable truth, the shift from quality control to longer-range, technical development deserves detailed planning and careful orientation. It may involve changes both in people and in facilities and equipment.

Developing Details

The next step, planning together with key personnel, is to work out specific details for your company. They may include the following points and any others pertaining to your own set-up: (1) Statement of objectives (most important results needed); (2) job description of recommended personnel (special qualities —technical and personal); (3) possible quality control tests (later you may add or drop various possible tests); (4) list of laboratory equipment, instruments, and the like (laboratory apparatus and equipment dealers can help in figuring costs); and (5) physical location and layout of the laboratory (people who will be working with the laboratory may have some good ideas).

You can recruit technologists for your installation through colleges, universities, and various professional societies. The American Chemical Society, for instance, maintains an employment clearing house in its Washington office with duplicate listings for employers' use in New York and Chicago. Local sections in Chicago, Philadelphia and Berkeley, California, maintain area employment clearing house services. Local chapters throughout the country also maintain lists of available, qualified laboratory personnel in the particular chapter area.

You'll also find that the American Society for Quality Control has many active chapters throughout the country. A telephone call to one of the chapter's officers will put you in touch with specialists who can help in finding suitable people for your particular needs. Note, also, that recording the results of each interview on some standardized form immediately after meeting a candidate has been found worthwhile.

Once your scientist is on the job, make sure that you provide adequate on-the-job training in your particular operations. Don't expect magic. Do expect to answer many questions. Organizationally, in the small plant, it has been found most helpful to have this man report to you. A copy of his reports or correspondence can be sent to the plant manager and any other interested official. Assigning him to report to more than one individual is generally asking for trouble.

test protein on the spot . . .

with this new 5 minute test

High protein means extra money in your pocket . . . but first you've got to find and measure it!

Now you can make your own reliable protein tests in five minutes or less . . . no more days of waiting for laboratory analysis. This means that you can bin your grain or flour by protein percentage *as soon as it's received* . . . blend your incoming shipments for the top resale profit.

This amazing new development, the UDY PROTEIN ANALYZER, introduces a newly discovered principle that now makes possible fast, economical, accurate "on the spot" analysis. You operate it simply without special skills or training.

Whole grain wheat is analyzed by weighing a specific sample and adding a measured amount of a special dye solution which reacts quantitatively with the protein. The sample is then wet milled in the unique React-R-Mill for three minutes. Reaction of the dye with protein is then complete and the remaining unbound dye is merely measured in the color analyzer. This reading is converted directly into protein percentage. Flour is analyzed in the same manner except that milling is unnecessary.

Phone, wire, or write now for further information on increasing your profits with the new UDY PROTEIN ANALYZER. Since production of these units is still limited, your early response may be particularly important.

for full details contact . . .

HEGMAN, INC.
506 Grain Exchange Building
Minneapolis 15, Minn.
Exclusive National Distributor

UDY ANALYZER COMPANY

2205 ORCHARD DRIVE • PULLMAN, WASHINGTON

MILL COGS

We make ALL kinds. Specialize in "Ready Dressed" cogs which are READY TO RUN the moment driven and keyed. Write for circular "DW" and instruction sheets free.

The N. P. Bowsher Co., South Bend, Ind.

PAPER SACKS FOR MILLERS

The Chatfield & Woods Sack Co.
CINCINNATI, O.

Worth Looking Into

New Products
New Services
New Literature

This reader service department announces the development of new and improved products, new services and new literature offered by manufacturers and suppliers. Claims made in this department are those of the firm concerned. Use the accompanying coupon to obtain the desired information.

No. 2144—Booklet on Cell Wall Control

A new booklet just published by Atlas Powder Co. explains how softeners can cause open grain and reduced loaf volume. The booklet also explains a new concept, "cell wall control," developed by Atlas cereal chemists, which is the key to regulating volume, shape and dough extensibility. The booklet tells how the cereal chemists isolated the factor in softeners that causes open grain, coarse texture and tough bite and then developed a new softener which balanced out the trouble-causing factor. A new product, ATMUL 500, is the result of this research. According to Atlas, ATMUL 500, a "mono" softener, will give close, uniform grain; silky, resilient texture; extra softness and rich, full flavor. The booklet also explains, with full illustrations, how ATMUL 500, with cell wall control, gives greater volume because of good oven spring and less shrinkage on the cooling racks, straight, sag-free side walls, perfect break and shred, and good machinability. For details check No. 2144 on the coupon, clip and mail to this publication.

No. 7617—Large Grain Bin

A "Giant Grain Bin" has been introduced by Martin Steel Corp. Available in 13 sizes, the new bin provides capacities ranging from 5,600 to 15,300 bu. for all small grains, soybeans and shelled corn. According to the company, the bin can be used for aeration as well as storage, with aerating equipment optional. It is constructed of heavy, reinforced 24-in. wall sheets. Other features include a ground-opening ridge cap and a combination rubber and steel ridge collar to prevent entry of snow, sleet or rain; soft lead washers for permanent caulking at bolt levels and positive weather seal and heavy anchoring brackets. The Giants come in 24 ft., 8 in. diameters in 13 heights. For more information, check No. 7617 on the coupon and mail to this publication.

No. 7645—Grain Bin

Added protection against weather and full, safe use of cone capacity are two of the features claimed for the large-size grain bins being introduced by Behlen Manufacturing Co. According to company literature, continuous-line construction of roof and sidewall insures wider eave seal protection against weather and a tighter seal for efficient fumigation. A 45° pitch roof angle, higher than the angle of repose grain, assures use of roof capacity. Other features list-

ed by the company include: fast, bolted-panel erection with butyl strip sealing; long-life, maintenance-free galvanizing; a variety of sizes to fit emergency or annex storage needs, and optional aeration and automatic handling equipment. Also available are inspection port adapters for the bin walls. Sizes are from 3,000 to 15,000 bu. in 16 and 27 ft. diameters. Check No. 7645 and mail for details.

No. 7639—Voltage Stabilizer

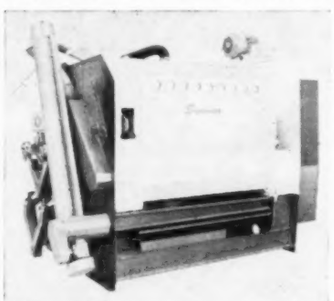
Hot Spot Detector, Inc., has announced an improvement and simplification of its "Electronic Potentiometer," used to determine temperatures of stored grain. Called the "Continuous Voltage Stabilizer," the new unit replaces the battery, standard cell and standardizing mechanism previously used in the electronic potentiometer. According to company literature, it assures uninterrupted response to changes in the measured variable voltage. For more information about the product, check No. 7639 on the coupon and mail.

No. 2147—Grain Weighing Hopper

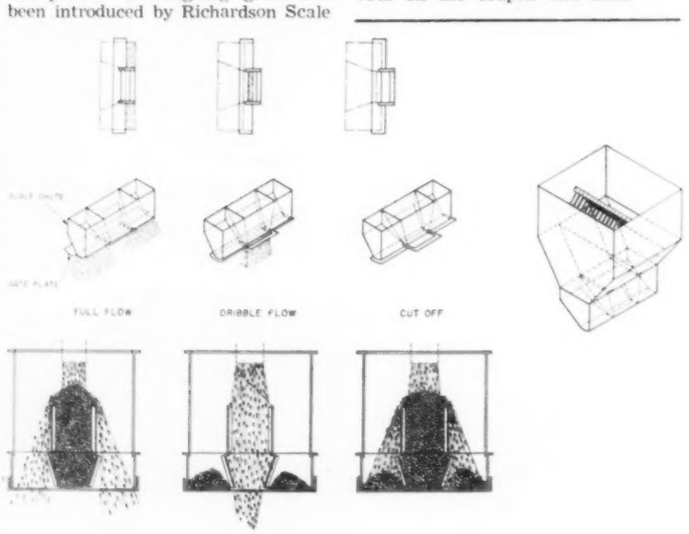
A new mechanical device which accumulates enough material to provide a uniform dribble stream in the process of weighing grain has been introduced by Richardson Scale Co. The "dribble reserve top hopper" is adaptable to both the 6 bu. and 10 bu. Richardson JJ grain receiving scales. With this new component, the incoming stream of grain is directed into a special dribble reserve compartment to build reserve necessary to feed an undiminished stream during the dribble. A gate plate in the chute at the bottom of this compartment opens to permit a full flow of grain to the scale until about four fifths of the full weighing has passed through. Then the gate plate automatically reduces the flow to a dribble. The stream itself then remains uniform, due to the accumulated reserve, assuring constant accuracy even under fluctuations in delivery of material to the scale. For details check No. 2147 on the coupon, clip and mail it to this publication.

No. 7648—Grain Cleaner

Superior Separator Co. announces a new 8-cylinder grain cleaner called the Commander 8. The unit divides grain into seven separate products and the eight cylinders provide high capacity. A larger fan gives more air for better aspiration, the company says. Increased grain-spread permits greater "put through" in the aspirator, it was noted. New features include vanes to provide



straight airflow, an adjustable air bleeder in the aspirator to prevent dust settling in dust pipe, a micrometer screw air control for more accuracy and flexibility of operation, and a self-cleaning scalper to eliminate clogging and reduce maintenance, the company said. One improvement, according to company literature, is a patented rotating outer trough which can be inverted for complete cleanout. For more information about the cleaner check No. 7648 on the coupon and mail.



Send me information on the items marked:

- ☐ No. 2144—Booklet
- ☐ No. 2147—Hopper
- ☐ No. 2148—Dryer
- ☐ No. 2149—Bulletin
- ☐ No. 2150—Conveyor
- ☐ No. 2151—Products
- ☐ No. 7615—Leasing
- ☐ No. 7617—Bin
- ☐ No. 7619—Bulletin
- ☐ No. 7625—Catalog
- ☐ No. 7639—Stabilizer
- ☐ No. 7645—Grain Bin
- ☐ No. 7648—Cleaner

Others (list numbers) .....

NAME .....

COMPANY .....

ADDRESS .....

CLIP OUT—FOLD OVER ON THIS LINE—FASTEN (STAPLE, TAPE, GLUE)—MAIL

FIRST CLASS PERMIT No. 2 (Sec. 34.9, P. L. & R.) MINNEAPOLIS, MINN.

BUSINESS REPLY ENVELOPE
No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY—

The Northwestern Miller

P. O. Box 67

Reader Service Dept. Minneapolis 40, Minn.

No. 7625—Equipment Catalog

Processing equipment for various industries is illustrated and described in a four-page bulletin (No. 59) released by the Bauer Bros. Co. Equipment shown for use in pulverizing, fiberizing, granulating and blending various materials includes the Bauer hammer mills, double and single disc attrition mills, single and double roll crushers and magnetic separators. Many other types of equipment are described. For copies, check No. 7625 on the coupon and mail.

No. 2148—Grain and Seed Dryer

A-C-E Supply & Equipment Co., Inc., has announced as an addition to its line of fans, aeration equipment and electronic temperature sensing cables, the "Pierpoint Grain & Seed Dryer." This dryer, embodying the principles of low heat levels, thin grain columns and simplicity of operation, offers larger drying capacity and economical rates combined with the advantages of "continuous flow." It features a minimum number of moving parts at prices equal to or lower than the cost of most batch dryers. For details check No. 2148 on the coupon, clip and mail.

No. 2149—Bulletin On Foaming Problems

One of the most complete stories ever presented on industrial foaming problems is now available from General Electric's silicone products department. The publication, CDS-204, answers such questions as, "What causes foaming?" "How Can you control costly foaming problems?" and many others. The publication explains how to choose the proper defoamer for both aqueous and non-aqueous systems. Included are recommendations on the equipment and methods to use in obtaining maximum performance from chemical defoamers. Of particular interest to laboratory personnel are techniques for easily evaluating the effectiveness of defoamers for a specific system. For details check No. 2149 on the coupon, clip and mail.

No. 2150—Package Conveying System

Sprout, Waldron & Co., Inc., has announced the availability of an advance specification sheet describing Pneu-Pac, a compact pneumatic conveying system for car, truck or bin unloading. The sheet illustrates a Pneu-Pac installation and includes an engineering drawing showing the main components. The capacity of the Pneu-Pac 40 is listed at 10 to 15 tons an hour for soft feed ingredients and 15 to 20 tons an hour for bulk whole grains or similar free flowing materials. Copies of the specification sheet, No. 214, are available on request. Simply check No. 2150 on the coupon, clip and mail to this publication.

No. 2151—Catalog On Products

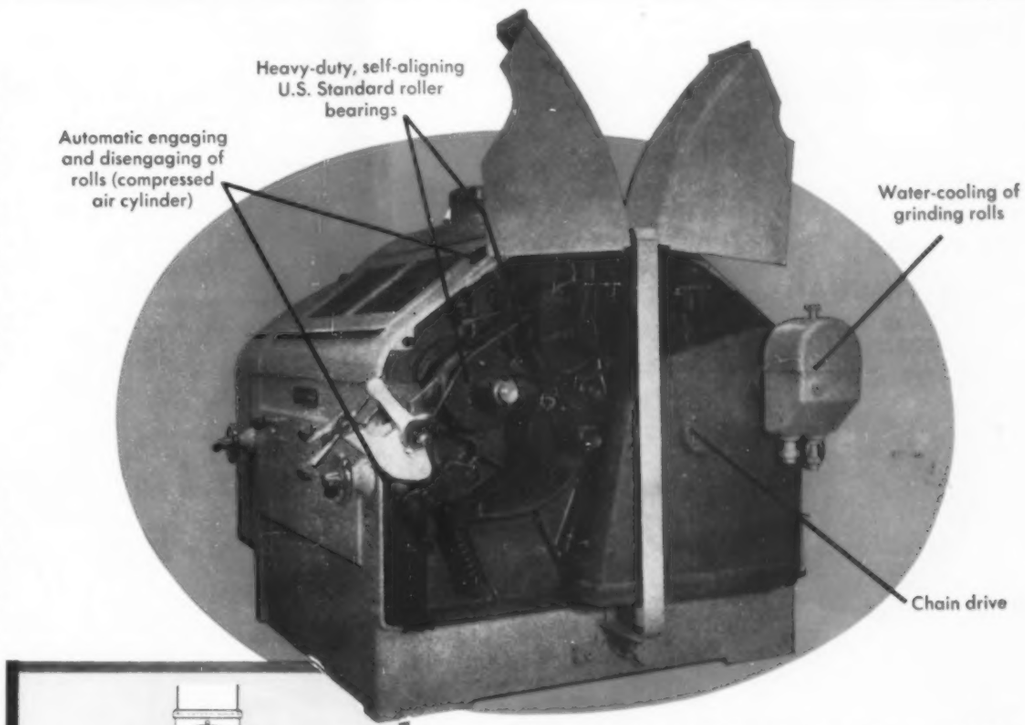
General American Transportation Corp. is offering copies of its 1960 catalog covering services and products for the process industries. Fully illustrated and in color, the catalog shows and explains such products and services as tank cars, Airslide cars, Dry-Flo cars, custom fabrication, field erection, tank storage terminals, mixing devices and a number of others. For more information on this catalog check No. 2151 on the coupon, clip and mail to this publication.

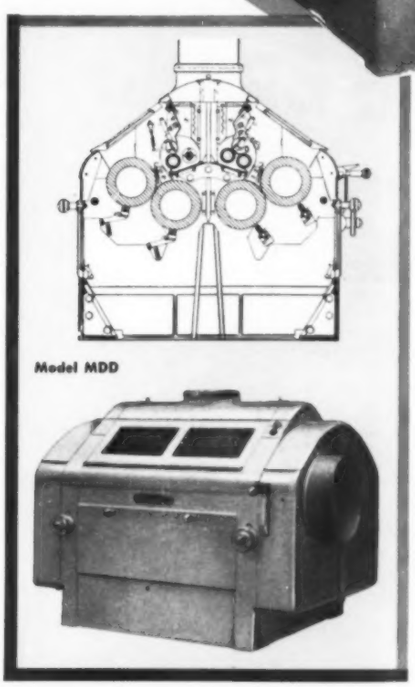
No. 7619—Bulletin on Stream Splitters

The availability of a revised bulletin describing a line of stream splitters has been announced by Sprout, Waldron & Co., Inc. In addition to close-up photographs of the unit, Bulletin 137-C has a full table of specifications, dimensions and approximate capacity. According to company literature, the splitter divides a single stream of dry, free-flowing material up to approximately ¼ in. ring size into anywhere from two to eight separate and uniform streams. For copies, check No. 7619 on the coupon and mail.

No. 7615—Auto Leasing Study

A study for executives and financial officers, recently published by the Foundation for Management Research, analyzes the advantages and disadvantages of leasing auto fleets for company salesmen in cities and over-the-road. The 24-page study includes full charts on costs involved in different fleet plans, and is based on records covering 29,264 autos. The report is titled "Advantages and Disadvantages of Auto Fleet Leasing: A Comparison of Company Ownership, Salesman Ownership and Leasing." For copies, check No. 7615 on the coupon and mail.


Heavy-duty, self-aligning U.S. Standard roller bearings
Automatic engaging and disengaging of rolls (compressed air cylinder)
Water-cooling of grinding rolls
Chain drive



Why BUHLER 4-Roller Mills help reduce production costs

More than 70,000 BUHLER-*Built* Roller Mills are in operation throughout the world. *That's more than any other make.* Here are some of the reasons:

Better Milling Results . . . are obtained through uniform grinding due to even and fully automatic feed, highest quality rolls, and precision adjustments.

Less Power Needed . . . Self-aligning roller bearings permit higher operating speeds and higher output, yet need up to 20% less power than conventional sleeve bearings.

Takes Less Floor Space . . . For example, the compact, streamlined 10" x 40" BUHLER occupies same space as conventional 9" x 36" mill. You get 10% more grinding surface from same floor space.

Highest Degree of Sanitation . . . New BUHLER design provides no dead corners in which insects may breed.

Low Maintenance Costs . . . due to sturdy design, high quality materials, and highest standards of workmanship.

OPTIONAL FEATURES

Automatic engaging and disengaging of grinding rolls to prevent damage when running empty.

Chain instead of gear drive.

Water cooling to keep product cool. Greater uniformity, better control of moisture loss, easier sifting.

4-speed regulator for feed rolls.

BUHLER

Serving the Flour Milling Industry since 1860

For more information on how BUHLER Engineers, BUHLER Experience, BUHLER Equipment can help you increase the efficiency of your mill, call or write . . .

Buhler Mill Engineering Co.
4207 Nicollet Ave., Minneapolis 9, Minn.

Sprout, Waldron & Co., Inc.
12 Logan Street, Muncy, Pennsylvania

Buhler Brothers, (Canada), Ltd.
24 King Street West, Toronto 1, Ontario

Ferguson Fumigants "Shot Cans" Give You

CONTINUOUS INFESTATION CONTROL

At the Lowest Possible Cost with

DAWSON® FUMIGANT

FORMULA 73

THE

- Low Dosage
- Pre-Measured
- Pre-Packaged
- Economical

SPOT FUMIGANT in 2-INCH SHOT CANS

DAWSON LOW-DOSAGE FUMIGANTS

DAWSON is a registered TM

- **SAFE**—LOW DOSAGE STRONG ODOR
- **SURE**—EFFECTIVELY KILLS ALL STAGES OF INSECTS PLUS RESIDUAL ACTION
- **FAST**—NO BOTTLES TO FILL NO BOTTLES TO BREAK LARGE NUMBER OF CANS MAY BE CARRIED AT ONE TIME LESS SHUT-DOWN TIME NEEDED SHORTER EXPOSURE PERIOD REQUIRED

YOUR ASSURANCE

Economical, effective, trouble-free spot fumigation is assured by our national reputation. We are the original developer of Dawson 73 Low Dosage Spot Fumigant (U.S. Patent No. 2,406,857). We serve a large percentage of the milling capacity in America today. Their own experience with our materials is a further assurance. Inquiries invited. We are a trained, experienced service organization dedicated to helping you get the best results at the most economical cost.

Call or Write Dept. "T" for Complete Information

FERGUSON FUMIGANTS
INCORPORATED
P. O. Box 5868
Ferguson 21, Mo. Phone PErshing 1-0414

Pathologist Reports Rust Susceptibility Of Wheat Varieties

UNIVERSITY PARK, PA. — Lee and Langdon wheat suffer much less from heavy attacks of stem rust than do other rust-susceptible varieties, B. P. Chakravarti, plant pathologist, University of Minnesota, reported at the recent annual meeting of the American Phytopathological Society. "Yet, these two wheats in a year of moderate rust attack come through no better than do other rust-susceptible varieties," he added.

The pathologist noted that the difference for an epidemic year is important. If Minnesota's wheat fields were again ravaged by race 15B of stem rust as they were in 1952, the "disaster protection" of Lee and Langdon could prevent total crop loss for many a wheat farmer. However, these findings apply only to race 15B of stem rust and it is conceivable that another race might develop some time and affect individual varieties differently, he said.

Mr. Chakravarti and Helen Hart, plant pathologist, U of M, started these studies three years ago by experimentally infecting wheat plots with different levels of stem rust. The tests showed that under mild rust attacks, there was little difference in yield reduction from the disease between Langdon and Lee, on one hand, and Carleton on the other.

Mr. Chakravarti noted that the tolerance of Lee and Langdon is similar to the "field resistance" that many scientists and farmers found certain potato varieties have to late blight. It is a characteristic which can be used in development of new and better wheat varieties, he concluded.

A. E. BAXTER ENGINEERING CO.
Designers and Engineers for Mills, Elevators and Feed Mills
1311-1315 GENESEE BUILDING BUFFALO 2, NEW YORK

Quality Satisfaction Service

Are Synonymous with

SHUTTLE BRAND

SILK NYLON

Registered Trade Mark

Manufactured for more than a century by

TRIPETTE & RENAUD
Sailly-Saillisel and Paris (France)

Sole Importers for U.S.A. and Canada

F. H. PAUL & STEIN BROS. INC.
235 Fifth Avenue New York 16, N.Y.
Phone: MU 4 (Murray Hill) 6370

Distributors

J. K. Howie Co. Minneapolis, Minn.
Capital Corrugating Co. N. Kansas City, Mo.
M.M.C. Sales Corp. Hamburg, N.Y.; Dover, Ohio

Cornell Announces Disease Resistant Variety of Wheat

ITHACA, N.Y.—A new variety of wheat that will resist three costly diseases has been developed at the New York State College of Agriculture, Cornell University, it was announced recently.

The wheat called Avon, will resist common bunt, dwarf bunt and loose smut, three highly destructive diseases which frequently plague wheat farmers. Genesee, the most widely grown wheat variety in New York State, will resist loose smut but not the other two, the Cornell report states.

The new wheat, which will be available in commercial quantities by the fall of 1960, was developed by Profs. Neal F. Jensen of the Cornell Department of Plant Breeding and Leon J. Tyler of the Department of Plant Pathology.

The scientists say that Avon is the first commercial variety of winter wheat in the eastern U.S. which combines genetic resistance to all three smut diseases. One of the diseases, dwarf bunt, has not been successfully controlled by seed treatment or chemicals. According to Avon's developers, it gives farmers "a built-in control before serious losses occur."

The researchers say the disease-resistant grain is suitable for crackers, cakes, cookies, bread and many prepared breakfast foods. Its general appearance is similar to that of Genesee, with a bronze chaff and yellow straw. Avon has a shorter, stiffer straw than Genesee, however, giving it greater strength to stay upright.

The scientists advise continued treatment of wheat seeds with fungicide even though Avon is used. Seed treatment is considered desirable in helping control other seed-carried diseases, and can delay the build-up of new smut races which may be capable of attacking Avon, they counsel.

Commercial growers are now developing supplies of the seeds so farmers will be able to obtain them next year, the report noted.

——BREAD IS THE STAFF OF LIFE——

Home Agents to See Cotton Bag Display

MEMPHIS — Colorful gift items made from cotton flour and feed bags will provide the theme for a display at the National Home Demonstration Agents Assn. meeting in New Orleans Oct. 20-24, it has been announced here by the National Cotton Council.

Participation in the convention is a facet of the annual cotton bag promotion campaign conducted by the council and the Textile Bag Manufacturers Assn.

The exhibit, stressing the sewing value of cotton containers, will be viewed by 1,000 U.S. home agents attending the meeting at the Jung Hotel. The NHDA is composed of trained home economists who instruct rural housewives in modern home management, food preparation, and sewing techniques. Through its members, the reuse advantages of bag fabrics will be brought to the attention of the nation's farm women—a primary consumer group for cotton-packaged products.

Carrying out a Christmas motif, the exhibit will feature toys, dolls and household accessories made from print and plain sacks. Free directions for cotton bag novelties will be offered to booth visitors.

Sterwin MATURING, BLEACHING, ENRICHMENT

Complete, Modern Flour Treatment...

You Can Bank On!

SHIP STERWIN-TREATED flour to your customers . . . and you (and they) can bank on it . . . secure in the knowledge that your experienced "know how" has teamed up with the very best in methods and materials. Sack after sack is matured, bleached, enriched exactly as you want it . . . as they ordered it.

For STERWIN Flour Treatment economically processes your flour with unprecedented uniformity . . . assures consistently superior baking qualities . . . provides the first step in finished baked goods that emerge from the oven exactly "as planned".

WHY? A brief study of these STERWIN processes and products tells why!

HY-KURE* . . . matures and bleaches flour in a revolutionary new way. Eliminates old gas generator . . . provides ClO_2 in frozen, solid form (illus.) . . . safer, surer . . . pinpoint accuracy in dispensing ClO_2. Automatic, more accurate, more simple from first step to last.

STERWIN CHLORINATOR . . . accurate, automatic metering of even the most minute quantities of chlorine. Effects economies through minimum maintenance and constantly uniform flour treatment.

STERWIN FEEDER . . . most accurate method for adding Vextram, Oxylite and powdered mixtures.

VEXTRAM* . . . the *original* low-ash starch base enrichment mixture. Enriches to government standards easily, accurately, economically.

OXYLITE* . . . Sterwin Flour Bleach "Double Checked" for power and performance in laboratory and mill. The bleach of choice in every milling state in the Union and in Canada.

See your Sterwin Technically Trained Representative or phone, wire (collect) or write:

IN CANADA:
Sterwin Chemicals of Canada Ltd.
Aurora, Ontario

Sterwin Chemicals INC.
Subsidiary of Sterling Drug Inc.
Flour Service Division
1125 MERRIAM BLVD., KANSAS CITY, KANSAS
SPECIALISTS IN FLOUR MATURING, BLEACHING AND ENRICHMENT

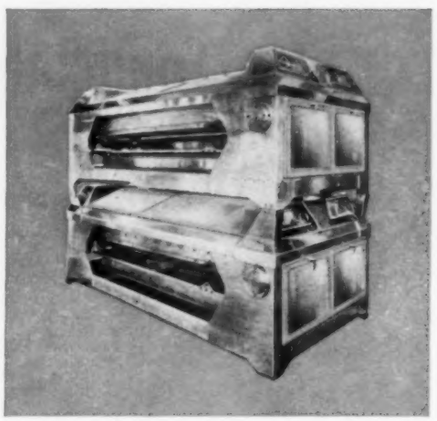
*Trademark—U. S. Patent No. 2,683,651. Other Patents Pending.

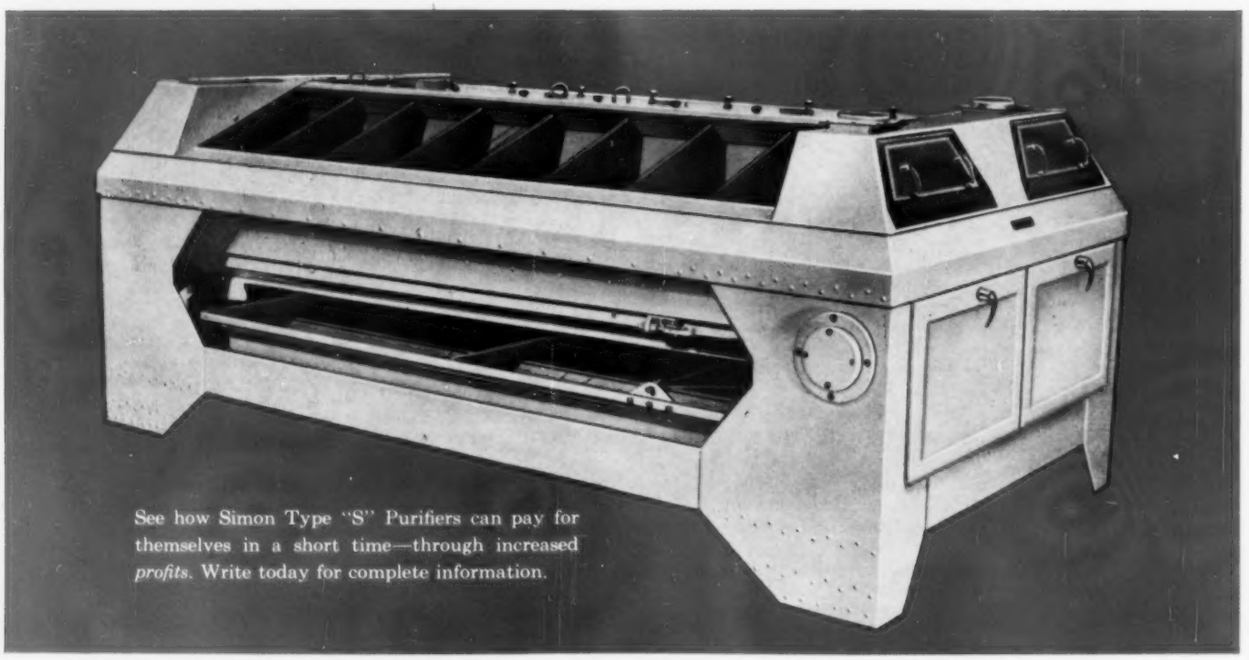
Get better purification, save space with SIMON type "S" Purifiers

You get the advantages of the most advanced purification method—plus ease of supervision, maintenance, and cleaning—when you install Simon's Type "S" Purifier.

You get high capacity in small space. Modern low-style construction allows for easy inspection and adjustment. The machines can be mounted two high to save space or to permit extensive re-purification.

The "S" Purifier's aluminum alloy construction and clean design reduce the risks of infestation. You're sure to meet the highest standards of sanitation. Triplex glass windows permit easy inspection.





See how Simon Type "S" Purifiers can pay for themselves in a short time—through increased *profits*. Write today for complete information.

SIMON-CARTER CO.

673 19th Ave. N.E. Minneapolis 18, Minn. STerling 9-2417